REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

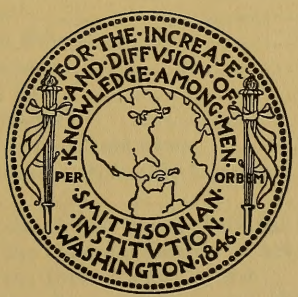
1931

SMITHSONIAN INSTITUTION
WASHINGTON
D. C.

REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION

FOR THE YEAR ENDING JUNE 30

1931



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THE SMITHSONIAN INSTITUTION

June 30, 1931

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Research associate.—Earl S. Johnson.
Associate research assistant.—E. D. McAlister.
Research assistant.—Leland B. Clark.

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REPORT

OF THE

SECRETARY OF THE SMITHSONIAN INSTITUTION

C. G. Abbot

FOR THE YEAR ENDING JUNE 30, 1931

To the Board of Regents of the Smithsonian Institution:

Gentlemen: I have the honor to submit herewith my report showing the activities and condition of the Smithsonian Institution and the Government bureaus under its administrative charge during the fiscal year ended June 30, 1931. The first 21 pages contain a summary account of the affairs of the Institution. Appendixes 1 to 11 give more detailed reports of the operations of the United States National Museum, the National Gallery of Art, the Freer Gallery of Art, the Bureau of American Ethnology, the International Exchanges, the National Zoological Park, the Astrophysical Observatory, the Division of Radiation and Organisms, the United States Regional Bureau of the International Catalogue of Scientific Literature, the Smithsonian library, and of the publications issued under the direction of the Institution.

SMITHSONIAN INSTITUTION

OUTSTANDING EVENTS OF THE YEAR

An appropriation of $10,000 was made by the Congress for preliminary architectural plans of the extensions to the Natural History Building of the United States National Museum authorized by Congress last year. The new reptile house of the Zoological Park was completed and formally opened to the public on February 27, 1931. A reorganization of several exhibition halls of the Arts and Industries Building of the National Museum has added greatly to the attractiveness of the exhibits of costumes, coins and stamps, and machinery. A small souvenir guide to the Institution and its branches has been published privately by the Smithsonian and seems highly appreciated by visitors. For unity of policy, greater efficiency, and simplification of records and accounts, the separate editorial staffs of the Smithsonian, the National Museum, and the Bu-

reau of American Ethnology have been consolidated under one general management and the offices brought closely together. Two exceptionally valuable publications, The Skeletal Remains of Early Man, by A. Hrdlička, and A History of Applied Entomology, by L. O. Howard, were completed. A bequest netting approximately $50,000 has been received from the estate of the late James Arthur. Its income is to be used for promoting knowledge of the sun. A friend of the Institution has announced to it a large intended bequest to promote and reward original investigation. Numerous valuable research and collecting expeditions by the National Museum, the Bureau of American Ethnology, and the Zoological Park have returned highly successful. Accounts of their results will be found below. A gigantic dinosaur, *Diplodocus longus*, 75 feet long, whose skeleton has been in preparation for several years, has been placed on exhibition. Improved methods of solar radiation research have been perfected and applied in connection with the observing stations at Table Mountain, Calif., and Mount Brukkaros, Southwest Africa. Volume V of the Annals of the Astrophysical Observatory, containing all results of the years 1920 to 1930, inclusive, on the measurement of solar radiation has been sent to press. The numerous variations of the sun since the year 1920 are represented by monthly mean values whose average probable error is less than 0.1 per cent. Long-continuing regular periodicities in solar variation are demonstrated. Highly accurate results on the spectral distribution of phototropism in plants have been obtained by the Division of Radiation and Organisms. By cooperative work with the Fixed Nitrogen Research Laboratory, excellent results on the absorption of pure organic chemicals in the infra-red spectrum have been reached, and an independent method for determining the ozone content of the earth's atmosphere has been worked out and applied at Table Mountain, Calif.

THE ESTABLISHMENT

The Smithsonian Institution was created by act of Congress in 1846, according to the terms of the will of James Smithson, of England, who, in 1826, bequeathed his property to the United States of America "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." In receiving the property and accepting the trust, Congress determined that the Federal Government was without authority to administer the trust directly, and therefore constituted an "establishment" whose statutory members are "the President, the Vice President, the Chief Justice, and the heads of the executive departments."

THE BOARD OF REGENTS

The affairs of the Institution are administered by a Board of Regents whose membership consists of "the Vice President, the Chief Justice, three Members of the Senate, and three Members of the House of Representatives, together with six other persons other than Members of Congress, two of whom shall be resident in the city of Washington and the other four shall be inhabitants of some State, but no two of them of the same State." One of the Regents is elected chancellor by the board. In the past the selection has fallen upon the Vice President or the Chief Justice, and a suitable person is chosen by the Regents as Secretary of the Institution, who is also secretary of the Board of Regents, and the executive officer directly in charge of the Institution's activities.

Changes in the personnel of the board during the year consisted of the loss of two citizen Regents: Robert S. Brookings, of Missouri, through expiration of his term, and Dwight W. Morrow, of New Jersey, through the automatic expiration of his term as a citizen Regent upon his induction into the office of United States Senator from New Jersey.

The roll of the Regents at the close of the fiscal year was as follows: Charles Evans Hughes, Chief Justice of the United States, chancellor; Charles Curtis, Vice President of the United States; members from the Senate, Reed Smoot, Joseph T. Robinson, Claude A. Swanson; members from the House of Representatives, Albert Johnson, R. Walton Moore, Robert Luce; citizen members, Irwin B. Laughlin, Pennsylvania; Frederic A. Delano, Washington, D. C.; and John C. Merriam, Washington, D. C.

FINANCES

The permanent investments of the Institution consist of the following:

Total endowment for general or specific purposes, (exclusive of Freer funds)	$1,747,881.52
Itemized as follows:	
Deposited in the Treasury of the United States, as provided by law	1,000,000.00
Deposited in the consolidated fund—	
Miscellaneous securities, etc., either purchased or acquired by gift; cost or value at date acquired	668,069.02
Springer, Frank, fund for researches, etc. (bonds)	30,000.00
Younger, Helen Walcott, fund (real estate notes and stock, held in trust)	49,812.50
Total	1,747,881.52

The above-mentioned funds of the Institution are described as follows:

Fund	United States Treasury	Consolidated fund	Separate funds	Total
Arthur, James, fund		$52,595.02		$52,595.02
Bacon, Virginia Purdy, fund		65,887.12		65,887.12
Baird, Lucy H., fund		2,176.54		2,176.54
Barstow, Frederick D., fund		1,000.28		1,000.28
Canfield collection fund		50,299.78		50,299.78
Casey, Thomas L., fund		9,503.63		9,503.63
Chamberlain fund		37,032.20		37,032.20
Hodgkins (specific) fund	$100,000.00			100,000.00
Hughes, Bruce, fund		17,963.17		17,963.17
Myer, Catherine W., fund		22,744.20		22,744.20
Pell, Cornelia Livingston, fund		3,175.03		3,175.03
Poore, Lucy T. and George W., fund	26,670.00	35,366.08		62,036.08
Reid, Addison T., fund	11,000.00	14,067.21		25,067.21
Roebling fund		158,706.78		158,706.78
Smithsonian unrestricted funds:				
Avery fund	14,000.00	48,970.50		62,970.50
Endowment fund		84,415.46		84,415.46
Habel fund	500.00			500.00
Hachenberg fund		5,291.03		5,291.03
Hamilton fund	2,500.00	530.79		3,030.79
Henry fund		1,590.43		1,590.43
Hodgkins general fund	116,000.00	39,439.14		155,439.14
Parent fund	727,640.00	1,605.31		729,245.31
Rhees fund	590.00	622.04		1,212.04
Sanford fund	1,100.00	1,170.63		2,270.63
Springer fund			$30,000.00	30,000.00
Walcott, Charles D. and Mary Vaux, fund		12,915.80		12,915.80
Younger, Helen Walcott, fund			49,812.50	49,812.50
Zerbee, Frances Brincklé, fund		1,000.85		1,000.85
Total	1,000,000.00	668,069.02	79,812.50	1,747,881.52

The Institution gratefully acknowledges gifts from the following donors:

Dr. W. L. Abbott, for archeological investigations in Haiti.

Estate of James Arthur, for investigations and study of the sun.

Frederic D. Barstow, purchase of animals for Zoological Park.

Mrs. Laura Welsh Casey, further contributions to Thomas Lincoln Casey fund for researches in Coleoptera.

Hon. Charles G. Dawes, for further search in Spain for valuable ancient documents.

Mr. Otto T. Mallery, for preparation of handbook on the Indians of the Southwest.

Research Corporation, for further contributions for research in radiation.

John A. Roebling, for further contributions for researches in radiation and studies in world weather records.

Charles C. Woodley, for general endowment fund of the Institution.

Maj. Leigh F. J. Zerbee, for endowment of the Frances Brincklé Zerbee aquaria.

From an anonymous friend for investigations in Old World archeology.

Freer Gallery of Art.—The invested funds of the Freer bequest are classified as follows:

Court and grounds fund	$604,625.07
Court and grounds maintenance fund	151,331.11
Curator fund	609,329.43
Residuary legacy	4,002,425.90
Total	5,367,711.51

The practice of depositing on time in local trust companies and banks such revenues as may be spared temporarily has been continued during the past year, and interest on these deposits has amounted to $5,026.75.

Cash balances, receipts, and disbursements during the fiscal year[1]

Cash balance on hand June 30, 1930		$214,870.17
Receipts:		
Cash from invested endowments and from miscellaneous sources for general use of the Institution	$74,306.66	
Cash for increase of endowments for specific use	81,559.89	
Cash gifts for increase of endowments for general use	5.00	
Cash gifts, etc., for specific use (not to be invested)	90,064.79	
Cash received as royalties from sales of Smithsonian Scientific Series	17,222.53	
Cash gain from sale, etc., of securities (to be invested)	317.09	
Cash income from endowments for specific use other than Freer endowment and from miscellaneous sources (including refund of temporary advances)	62,528.93	
Cash capital from sale, call of securities, etc. (to be reinvested)	63,998.50	
Total receipts other than Freer endowment		390,003.39
Cash receipts from Freer endowment—income from investments	311,377.40	
Gain from sale, etc., of securities (to be invested)	110,334.34	
Cash capital from sale, call of securities, etc. (to be reinvested)	1,160,106.80	
		1,581,818.54
Total		2,186,692.10
Disbursements:		
From funds for general work of the Institution—		
Buildings, care, repairs, and alterations	3,246.94	
Furniture and fixtures	700.49	
General administration[2]	23,091.60	
Library	3,163.31	
Publications (comprising preparation, printing, and distribution)	23,690.54	
Researches and explorations	21,960.16	
International exchanges	4,982.01	
		80,835.05

[1] This statement does not include Government appropriations under the administrative charge of the Institution.

[2] This includes salaries of the Secretary and certain others.

Disbursements—Continued.		
From funds for specific use other than Freer endowment—		
Investments made from gifts, from gain from sales, etc., of securities and from savings on income	$78,074.41	
Other expenditures, consisting largely of research work, travel, increase and care of special collections, etc., from income of endowment funds and from cash gifts for specific use (including temporary advances)	185,547.69	
Cash capital from sale, call of securities, etc., reinvested	59,873.34	
		$323,495.44
From Freer endowment—		
Operating expenses of gallery, salaries, purchases of art objects, field expenses, etc	289,883.42	
Investments made from gain from sale, etc., of securities and from income	110,128.62	
Cash capital from sale, call of securities, etc., reinvested	1,158,127.73	
		1,558,139.77
Balance June 30, 1931		224,221.84
Total		2,186,692.10

Recapitulation of receipts, exclusive of Freer funds during the year ending June 30, 1931

General uses:		
For addition to endowment	$4,663.67	
Reserved as income	86,870.52	
		$91,534.19
Specific uses:		
Gifts accretions to endowment [3]	81,559.89	
Gifts for specific use not to be invested	90,064.79	
Cash income from endowments for addition to endowment	6,026.26	
Cash income from endowments and from other sources for conducting researches, explorations, etc	56,502.67	
Cash capital from sale, call of securities, etc. (to be reinvested)	64,315.59	
		298,469.20
Total receipts, exclusive of Freer funds		390,003.39

[3] Approximately $22,000 of this amount was paid in connection with the settlement of estate.

Statement of endowment funds

	General purposes	Specific purposes other than Freer endowment	Freer endowment
Endowment fund June 30, 1930	$1,033,789.85	$636,792.55	$5,300,929.50
Increase from income, gifts, etc	11,971.41	65,009.27	5,697.95
Increase from gain from sales of securities, stock dividends, etc	204.07	114.37	61,084.06
Endowment June 30, 1931	1,045,965.33	701,916.19	5,367,711.51

The following appropriations were made by Congress for the Government bureaus under the administrative charge of the Smithsonian Institution for the fiscal year 1931:

Salaries and expenses		$38,304
Gellatly art collection		20,000
International Exchanges		52,810
American Ethnology		70,840
International Catalogue of Scientific Literature		8,145
Astrophysical Observatory		37,560
National Museum:		
Furniture and fixtures	$33,740	
Heating and lighting	93,120	
Preservation of collections	596,644	
Building repairs	56,940	
Books	3,000	
Postage	450	
Plans for additions to Natural History Building	10,000	
		793,894
National Gallery of Art		45,218
National Zoological Park		220,520
National Zoological Park, building for reptiles		28,000
Printing and binding		99,000
Total		1,414,791

MATTERS OF GENERAL INTEREST

PRESENTATION OF LANGLEY MEDAL TO MANLY AND BYRD

As mentioned in my last report, the fifth and sixth awards of the Langley Gold Medal for Aerodromics were made late in 1929 to Charles Matthews Manly (posthumously) and to Admiral Richard Evelyn Byrd, respectively. On December 11, 1930, at the annual meeting of the Board of Regents of the Institution, the posthumous presentation of the medal to Mr. Manly was made through the person of his eldest son. In presenting the medal, the chancellor of the board, Hon. Charles Evans Hughes, spoke of the previous awards and then said:

It was awarded posthumously to Charles Matthews Manly at the board's meeting of December 12, 1929. This exceptional action was taken in recognition

of the fact that the outstanding merit of Mr. Manly's invention and construction of the light, radial, gasoline airplane engine has become more and more apparent in the last years.

Mr. Hughes then quoted Mr. Charles L. Lawrance, president of the Wright Aeronautical Corporation, in part, as follows:

When we consider that the most popular type of airplane engine of to-day is almost identical in its general detail and arrangement with the one evolved by Charles Manly in 1902, we are lost in admiration for a man who, with no data at his disposal, no examples of similar art on which to roughly base his design, and no workmen capable of making the more difficult parts of his engine, nevertheless, through the processes of a logical mind, the intelligent application of the science of mathematics, and the use of his surprising mechanical skill, succeeded in constructing an engine developing 52.4 horsepower for a weight of 125 pounds, or a weight of 2.4 pounds per horsepower, which stood up under severe tests, once even going through a full-power, nonstop run of 10 hours.

Mr. Manly accepted the medal on behalf of his father, and concluded with the words, "I am sure that if he were living there is no honor which he would so greatly treasure."

The presentation of the medal to Admiral Byrd was made at the Smithsonian on the morning of March 27, 1931, by Chancellor Hughes. After reviewing the purpose of the founding of the Langley medal, Mr. Hughes said:

Your investigations in connection with the science of aviation have included severe tests of airplanes, their navigating instruments, and the possibilities of using them for geographical exploration. In these enterprises you have made the nonstop west-east passage of the Atlantic, the first nonstop flight to the North Pole, and the first nonstop flight to the South Pole. You have explored and photographed great regions of the globe hitherto unseen by man.

It gives me great pleasure to present to you, Admiral Byrd, the Langley Gold Medal for Aerodromics, in recognition of your outstanding investigations relating to the application of the science of aerodromics to geographical exploration.

Admiral Byrd, in expressing his appreciation of the award, concluded:

All fliers have the deepest respect for the work of Professor Langley. My own feeling of respect is so profound that this rare medal is doubly precious to me in bearing his name.

His work was epochal in the evolution of aviation, and may I remark here that I believe all age-old things in a state of civilization must follow the great law of evolution as do all things in a state of nature. * * * But here is the big point—because space is practically unlimited the evolution of aviation has fewer limits than ground-held things.

SMITHSONIAN SCIENTIFIC SERIES

In 1926 the Institution reached an agreement with a New York publishing firm for the issuance of a series of popular, illustrated volumes dealing with the branches of science covered by the activi-

ties of the Smithsonian and its branches. The Institution receives a definite royalty from the sale of the books which provides greatly needed additional funds for the continuation of its researches. Volumes 1 to 4 were issued in 1929, and volumes 5 to 8 in 1930. The titles are as follows:

1. The Smithsonian Institution, by Webster Prentiss True.
2. The Sun and the Welfare of Man, by Charles Greeley Abbot.
3. Minerals from Earth and Sky. Part I, The Story of Meteorites, by George P. Merrill. Part II, Gems and Gem Minerals, by William F. Foshag.
4. The North American Indians. An account of the American Indians north of Mexico, compiled from the original sources, by Rose A. Palmer.
5. Insects: Their Ways and Means of Living, by R. E. Snodgrass.
6. Wild Animals in and out of the Zoo, by William M. Mann.
7. Man From the Farthest Past, by C. W. Bishop, C. G. Abbot, and A. Hrdlička.
8. Cold-Blooded Vertebrates, by C. W. Gilmore, D. M. Cochran, and S. F. Hildebrand.

Volumes 9, 10, and 11 were in press at the close of the year, and the manuscript of volume 12 was practically completed.

The first edition of the series to be put on the market was a limited de luxe set known as the James Smithson memorial edition; this was quickly sold out. The publishers are now selling two distinct editions known as the patrons' edition and the William Howard Taft memorial edition.

RESEARCHES IN EUROPEAN ARCHIVES

Dr. C. U. Clark continued his research work among the European archives under the grant furnished by Ambassador Charles G. Dawes in 1929. In addition to the important materials listed last year, Doctor Clark has made some very interesting new discoveries of manuscripts relating to the ethnology of many tribes of North and South America. In the library at Evora in Portugal he brought to light a great many documents of unusual interest which had been deposited by Jesuit missionaries of the early colonial period in Brazil. In the British Museum Doctor Clark discovered some important works of Francisco Cardenas relating to the Maya Indians of Yucatan. In addition to the new work in Portugal and England, Doctor Clark continued his researches in the archives of the Indies at Seville and in the Vatican Library and the Propaganda Fide in Rome. Insomuch as the Dawes fund will expire in September, Doctor Clark will bring his work to a conclusion at that time. The results that have been obtained as a result of this research have been exceptionally valuable, and the interesting material brought to light was considerably more than might have been expected. Although the research was undertaken primarily for the purpose of locating material on the Maya Indians of Yucatan, in

the course of the work documents of unusual interest were found which concerned tribes covering most of North and South America and the islands of the West Indies.

COOPERATIVE ETHNOLOGICAL AND ARCHEOLOGICAL INVESTIGATIONS

In 1928 an appropriation of $20,000 was authorized by Congress for cooperative ethnological and archeological investigations in the United States. Proposed investigations were to be approved by the Secretary of the Smithsonian Institution, who allotted from this appropriation a sum equal to that raised for the work by the organization proposing it. Seven projects were approved during the past year and sums were allotted to them as follows:

Allotments from the fund for cooperative ethnological and archeological investigations during the fiscal year ended June 30, 1931

1930

July 3. Laboratory of Anthropology, to conduct archeological investigations of Basket Maker culture in the Guadalupe Mountain area of southeastern New Mexico for the purpose of locating, exploring, and thoroughly examining both disturbed and undisturbed Basket Maker sites and establishing the principal characteristics of this area. A study and recording of pictographs found in this area will also be made, $900.

July 8. University of Utah, to conduct archeological investigations and explorations in the State of Utah and the intensive excavation of one or two sites chosen as a result of the explorations, $800.

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Feb. 18. Laboratory of Anthropology, to continue the reconnaissance and excavation, where desirable, of Basket Maker sites in the Guadalupe Mountains and adjacent sections on the north and west, $213.15 (together with unexpended balance of $386.85 from previous allotment).

Mar. 26. University of Utah, to conduct archeological investigations at Promontory Point, Great Salt Lake, Utah, and to continue the archeological reconnaissance begun in the fall of 1930 in the drainage of the Sevier River in west central Utah, $250.

Mar. 26. Logan Museum, to conduct archeological investigations along the upper Missouri River, excavating earth-lodge villages belonging to the Arikara before 1850, $250.

Apr. 21. The State Historical Society of Colorado, for a general investigation, reconnaissance, and mapping of the so-called Paradox Valley country with intensive work on a single site to be selected as a result of the reconnaissance, $175.

May 28. University of Denver, to complete the archeological survey of eastern Colorado begun during the summer of 1930, $250.

At the beginning of the fiscal year the balance of the fund for cooperative ethnological and archeological investigations was very low, but by combining the unexpended balances on a number of the allotments it was possible to make the above grants.

EXPLORATIONS AND FIELD WORK

Twenty-nine expeditions went out during the year in the interests of the Institution's investigations in geology, biology, anthropology, and astrophysics. Besides numerous localities in the United States, these expeditions visited many other parts of the world, including Africa, Alaska, Canada, China, Haiti, Santo Domingo, the South Sea Islands, Spain, and the West Indies.

Many unique specimens were brought back to the Institution for study, and much-needed information was obtained in the field. The Smithsonian is indebted to its friends and to other scientific institutions for a considerable part of the expense of these expeditions, as its own meager funds for this purpose were exhausted early in the year.

Among the year's expeditions I may mention particularly Dr. Paul Bartsch's third year of explorations for mollusks in the West Indies, this year's work covering the southern Bahamas, the islands off the south coast of Cuba, and the Caymans; further anthropological researches in Alaska by Dr. Aleš Hrdlička and Henry B. Collins, jr., Doctor Hrdlička working along the Kuskokwim River and Mr. Collins on St. Lawrence Island; biological collecting on "Tin Can Island" in the Tonga Archipelago by Lieut. Henry C. Kellers, United States Navy, through the cooperation of the Navy Department and the United States Naval Observatory; the Parish-Smithsonian expedition to Haiti, organized by the late Lee H. Parish with the financial assistance and cooperation of his father, S. W. Parish, for the purpose of making general biological collections on the little-worked islands off the Haitian coast; and the continuation of the collecting explorations of the Rev. David C. Graham near Suifu, China, which resulted in over 62,000 specimens for the National Museum.

Brief accounts of certain of the year's expeditions will be found in the reports of the National Museum and the Bureau of American Ethnology appended hereto. All are described and illustrated in the Institution's yearly pamphlet, Explorations and Field Work of the Smithsonian Institution, 1930, publication No. 3111.

PUBLICATIONS

On March 1, 1931, the editorial work of the Institution and its branches was consolidated in a central office under the direction of the editor of the Institution. The steadily increasing output of the Smithsonian made it desirable to centralize authority to a certain extent in the interests of a more uniform policy and style and to prevent duplication of effort in the keeping of financial and other records. The volume of work passing through the editorial office

will be apparent from the fact that nearly $120,000 is now spent for printing each year; at certain periods of the year as many as 60 separate publications are in press at one time, some of them containing hundreds of manuscript pages, and most of them highly technical papers requiring careful editing and proofreading. It is hoped that the increased efficiency from a business standpoint of the recent reorganization will result in releasing more time of the small editorial staff for straight editorial work, to the end that Smithsonian publications may appear with greater accuracy and promptness.

The Institution's publications constitute its primary means for accomplishing the diffusion of knowledge. They are issued by the Institution proper and by the bureaus under its administrative direction and appear in 13 distinct series, as follows:

Smithsonian Institution:
- Annual report (with general appendix made up of selected articles reviewing the year's advances in science).
- Contributions to Knowledge (suspended).
- Miscellaneous collections.
- Special publications.

National Museum:
- Annual report.
- Bulletin.
- Proceedings.
- Contributions from the National Herbarium.

Bureau of American Ethnology:
- Annual report (with accompanying papers on ethnological subjects).
- Bulletin.

Astrophysical Observatory:
- Annals.

National Gallery of Art:
- Catalogue.

Freer Gallery of Art:
- Publications.

Ninety-eight volumes and pamphlets were published during the year in these various series, and 205,711 copies of Smithsonian publications were distributed. This number included 27,425 volumes and separates of the Smithsonian Miscellaneous Collections, 25,984 volumes and separates of the Smithsonian annual reports, 4,627 Smithsonian special publications, 86,680 publications of the National Museum, and 29,475 publications of the Bureau of American Ethnology. The titles and authors of the year's publications will be found in the report of the editor, Appendix 11.

LIBRARY

The Smithsonian library contains about 800,000 volumes, pamphlets, and charts, pertaining largely to science and technology. It comprises 10 divisional libraries, one of which—the National Museum

library—includes 36 sectional libraries, the small working units maintained in the offices of the curators and other Museum officials. The year's accessions totaled 14,050, including 6,972 volumes and 7,078 pamphlets and charts. Among the many gifts received during the year may be mentioned several thousand volumes and pamphlets from the library of the late Dr. George P. Merrill, presented by Mrs. Merrill and the other heirs; 600 scientific publications from Mrs. Dora W. Boettcher; and 386 volumes and pamphlets from the heirs of the late Dr. O. P. Hay.

Work on the union catalogue progressed satisfactorily. The staff completed the shelf list of the Museum library, catalogued the publications of the Carnegie Institution of Washington and the John Donnell Smith collection, and made progress in reclassifying and recataloguing the library of the Freer Gallery of Art. A number of special activities were carried forward, such as the checking and completing of sets of publications, the transfer to other organizations of certain publications not needed at the Institution, and the exchange of duplicate publications for others needed to complete sets.

GOVERNMENTALLY SUPPORTED BRANCHES

NATIONAL MUSEUM

The appropriations for the maintenance of the Museum totaled $830,394, which included provision for four additional employees, namely, an associate director, a clerk in the library, and two guards. Although these additions are of great help to the efficient operation of the Museum, there are still many offices, particularly in the scientific departments, where the need for more workers is urgent. The second deficiency bill for 1931 carried $10,000 for the preparation of preliminary plans for the two wings to be added to the Natural History Building under an authorization by Congress in the previous year. These plans, in course of preparation by the Allied Architects Incorporated, will provide for two wings similar in arrangement to the present building, that is, with the ground floor and the third floor devoted to offices and laboratories and the two floors between occupied by exhibits. This additional space will relieve the present badly overcrowded condition in the natural history department of the Museum; a similar need for space will still exist, however, in the arts and industries department and the division of history, and it is hoped that buildings for these collections, which are of such great interest to the public, may soon be provided.

The year's additions to the collections exceeded in number those of any previous years in the Museum's history, reaching a total of 1,022,850 individual specimens. Gifts of duplicates to schools totaled 7,384 specimens, and 31,516 specimens were loaned to scientific workers outside of Washington.

The department of anthropology received additional ethnological material from Alaska resulting from the explorations of Dr. Aleš Hrdlička and H. B. Collins, jr., giving the Museum the most complete collection in existence of the ancient ivory culture of the Bering Sea region. About 5,000 specimens illustrating the life of the American Indian were received as a bequest from the late Victor J. Evans, of Washington. Further material representing the native tribes of West Africa was given by C. C. Roberts.

The most important accession in the department of biology was the Barnes collection of Lepidoptera, purchased by a special appropriation of $50,000 to the Department of Agriculture and transferred to the Museum. Additional material has been received as a result of the field activities of Dr. David C. Graham in China and of Dr. Hugh M. Smith in Siam. Dr. H. C. Kellers obtained large collections of material for the Museum from the island of Niuafoou in the Pacific. A large collection of birds, mammals, reptiles, and plants obtained by E. G. Holt on an expedition to the boundary region between Venezuela and Brazil was presented by the National Geographic Society.

Thirty-two species of minerals new to the collection were received by the department of geology, chiefly by purchase through the Roebling fund. Other interesting accessions included a large mass of native silver and calcite estimated to contain 220 pounds of pure silver; a vertebra of an extinct reptile, which has fossilized into opal; and a green tourmaline weighing 17.9 carats, purchased through the Chamberlain fund. Many valuable fossil specimens were added during the year, particularly through the explorations of C. W. Gilmore and Dr. J. W. Gidley.

In the arts and industries department one of the most interesting accessions was the airplane *Bremen*, the first heavier-than-air craft to make the east-west nonstop flight across the North Atlantic. This was deposited by the New York Museum of Science and Industry. Of especial interest also was a model showing a section of the Conowingo hydroelectric generating station, presented by the Philadelphia Electric Co. The division of graphic arts received a miniature book, The Gospel of St. Matthew, printed in 2½-point type, the smallest type ever cast. Among the especially interesting accessions in the division of history were a chair owned by Benjamin Franklin, a chair belonging to President James Madison, and a mahogany screen owned by George Washington.

In search of specimens and information needed in the progress of the scientific investigations carried on by the Museum many expeditions were in the field during the year, financed either by the Smithsonian Institution or by contributions from interested friends. The results of the researches of the staff were published by the Museum

in 7 volumes and 41 separate papers. The distribution of its publications totaled 86,680 copies. The number of visitors during the year was 1,669,140.

NATIONAL GALLERY OF ART

Three exhibitions were held in the gallery during the year: A collection of 78 water colors by William Spencer Bagdatopoulos, a memorial exhibition of water colors by Henry Bacon, and the fortieth annual exhibition of the Society of Washington Artists.

Art works received by the Institution, subject to transfer to the national gallery upon approval of the National Gallery of Art Commission, included several portraits, among them a portrait of Commodore Stephen Decatur by Gilbert Stuart, bequeathed by the late Stephen Decatur Parsons. Among the loans accepted by the gallery were 15 paintings by British and Dutch masters lent by the executors of the estate of the late Henry Cleveland Perkins, and five paintings by old masters lent by Mrs. Marshall Langhorne.

Four paintings were purchased during the year from the Henry Ward Ranger fund by the Council of the National Academy of Design. Under the conditions of Mr. Ranger's will, the National Gallery may claim any of the pictures thus purchased during the 5-year period beginning 10 years after the artist's death and ending 15 years after his death.

The director, Professor Holmes, calls attention to the fact that just 60 years have passed since he first entered the doors of the Smithsonian Institution, where he was almost immediately employed as an artist. It may be added that since that time, except for short periods of connection with other organizations, he has remained with the Smithsonian and has served it with marked success in the fields of geology and anthropology as well as of art. To few men is it given to achieve distinction in three major fields of activity and to continue at the age of 85 in the able direction of such an important enterprise as the National Gallery of Art.

FREER GALLERY OF ART[1]

Additions to the collections by purchase include a Chinese bronze vessel of the fifth century B. C.; two Chinese jade ornaments of the third century B. C.; Nepalese, Persian, and Arabic manuscripts; and Chinese, Indian, Nepalese, and Persian paintings.

The year's curatorial work embraced the studying and recording of inscriptions and seals on recently acquired Chinese paintings and of Buddhist inscriptions on stone sculptures and votive bronze

[1] The Government's expense in connection with the Freer Gallery of Art consists mainly in the care of the building and certain other custodial matters. Other expenses are paid from the Freer endowmennt funds.

images. The cataloguing of the near eastern section of manuscripts and paintings was completed. Translation of the Persian texts has identified more than 60 Persian miniatures taken from various early manuscripts. Translations have also been made of inscriptions on objects submitted by outside persons and by other institutions for expert opinion. A total of 2,312 objects and 107 photographs of objects were sent in for such opinion.

Important changes in exhibition were made during the year. Galleries I and II are now devoted to the display of works of art from the Near East and India; gallery XIV now contains ancient bronzes, silver, and silver gilt; gallery XVIII exhibits scroll paintings; and gallery XIX displays pottery, porcelain, and panel paintings.

The total attendance for the year was 125,789; of these 1,510 came to the office in connection with studies or for other special purposes. Fifty-two groups were given docent service in the galleries and 10 classes were given instruction in the study room.

In spite of existing difficult conditions, the gallery's expedition in China under direction of C. W. Bishop carried out important excavations in southwestern Shansi. The principal aim of the gallery in this work is to help establish an atmosphere of greater mutual regard and confidence between native and foreign scientists.

BUREAU OF AMERICAN ETHNOLOGY

The bureau continued its diversified researches among the Indians in various parts of the United States and at one locality in Canada. The chief of the bureau, M. W. Stirling, visited several sites of archeological interest in Florida and chose for excavation a large sand burial mound on Blue Hill Island in the Ten Thousand Islands group off the west coast. He then investigated several sites on the island of Haiti in company with H. W. Krieger, of the National Museum. Returning to Florida, work was continued in the eastern part of the State, in the course of which two series of large geometric earthworks were discovered on the eastern side of the Everglades.

Dr. John R. Swanton was engaged in field work among various tribes in Louisiana during the first part of the fiscal year, and later devoted considerable time in Washington to the editing of Gatschet's material on the Atakapa language. Dr. Truman Michelson worked among the Kickapoo and Cheyenne of Oklahoma and the Fox of Iowa. John P. Harrington prepared his report on the San Juan Indians of California, and later in the year returned to that State to continue his studies, this year on the Esselen and Antoniano Indians in the southern part of Monterey County.

Dr. F. H. H. Roberts, jr., concluded his excavations begun the previous year at a site on the Zuñi Reservation, N. Mex., and later in the year began work on the ruins of a large pit-house village near Allantown, Ariz. J. N. B. Hewitt again visited the Grant of the Six Nations of the Iroquois on the Grand River in Ontario, Canada, and briefly the Tuscarora reservation in western New York State, in connection with the Iroquois texts which he is preparing for publication. Winslow M. Walker was added to the bureau staff as associate anthropologist in March, 1931. Toward the end of the year he left Washington to investigate a number of caves near Gilbert, Ark., and on June 30 the work was still in progress. Miss Frances Densmore continued her study of Indian music for the bureau, working particularly with the Chippewa on Lake Superior and the Seminole of Florida.

The bureau issued two annual reports and three bulletins during the year and distributed 20,475 copies of its publications.

INTERNATIONAL EXCHANGES

The exchange service handles for the United States the official exchange with all other countries of parliamentary documents, departmental documents, and miscellaneous scientific and literary publications.

The number of packages of such publications handled during the year was 641,338, a decrease of 53,327 from the previous year; the weight of this material was 642,190 pounds, a decrease of 65,904 pounds.

As usual, aid was given the Library of Congress in procuring needed foreign publications, as well as a number of other establishments here and abroad in obtaining specially desired publications.

NATIONAL ZOOLOGICAL PARK

The year has been marked at the Zoo by an unusually large number of accessions and by the opening of the new reptile house, enabling the park for the first time to exhibit these interesting creatures. The year's accessions totaled 1,266 animals, while 761 were lost through death, exchange, or return of animals on deposit, leaving a total of 2,501 in the collection at the close of the year. The outstanding accession of the year was the bequest of the Victor J. Evans collection of 244 animals, representing 133 species, which comprised Mr. Evans's private zoo and which contained a number of rarities. To illustrate the unusual importance of the year's additions, it may be said that 63 species were shown for the first time in the National Zoological Park.

Visitors to the park totaled 2,171,515, a slight decrease from the previous year's total. The fact that there was not a greater decline in number of visitors, as there was in other similar institutions owing to the present economic depression, was due to the great public interest shown in the new reptile exhibits. Attendance of school groups numbered 649 from 21 States, comprising 34,026 individuals.

The new reptile house was opened on February 27, 1931, with a reception attended by 3,000 people. The building contains special lighting and ventilating systems and all the modern features known for the best exhibition of animals. Since its opening it has become the most popular building in the entire park. The most urgently needed additional building is one for small mammals and the great apes; plans for this building are now being prepared under an appropriation by Congress for the purpose.

ASTROPHYSICAL OBSERVATORY

A large part of the year's work was devoted to the preparation of text, tables, and illustrations for Volume V of the Annals of the Astrophysical Observatory, which will cover the results of observations made at the several stations since August, 1920. The entire manuscript was sent to the printer toward the end of June.

The three stations at Montezuma, Chile, Table Mountain, Calif., and Mount Brukkaros, Southwest Africa, have continued observations of the radiation of the sun on all possible days. The results from the last two stations have not proved as satisfactory as those from Montezuma, and considerable effort has been expended on improving them. During the year new varieties of the short method of determining the solar constant of radiation, applicable to conditions at Table Mountain and Mount Brukkaros, have been worked out, with resulting great improvement in the values from these two stations.

Upon the completion of the reduction of all the solar constant observations from the three field stations interesting results have been derived from their comparison. Whereas the probable error of the monthly mean values since 1920 is less than 0.1 per cent, the extreme range of the solar constant values is 2.8 per cent. The march of solar variation since 1920 may be expressed very faithfully as the sum of five regular periodicities of 68, 45, 25, 11, and 8 month intervals. The curve of temperatures at Washington, D. C., and Williston, N. Dak., may also be represented by the sum of these same periodicities with the addition of an 18-month period. These results are so striking as to offer great hope that the relationship between solar variation and the weather may enable the skilled meteorologist to forecast principal changes of weather far in advance.

In the hope of finding a site as satisfactory as Montezuma, Chile, for solar observations, an expedition supported by John A. Roebling and headed by A. F. Moore is now in the field testing various localities in Africa and outlying regions.

DIVISION OF RADIATION AND ORGANISMS

During the second year of the existence of the Division of Radiation and Organisms, under direction of Dr. F. S. Brackett, a number of researches in physics and chemistry in connection with biophysics were begun. The phototropic experiments upon oat coleoptiles initiated during the previous year were continued with refinement of technique by Doctors Johnston and McAlister. The purpose of this investigation was to determine the phototropic response of the oat coleoptile toward light of different colors, or of different spectral regions, by means of light filters, and this year's more elaborate experiments showed results in striking agreement with the rougher results of the previous year.

Preliminary experiments on the carbon dioxide assimilation of wheat plants were conducted by Doctor Johnson and Mr. Hoover, using special all-vitreous growth chambers. Entire plants are used instead of individual leaves as in earlier work, and a typical day's run of the recording apparatus shows the carbon dioxide assimilated for different light intensities. Equipment is being developed for more elaborate experiments using approximately monochromatic light.

Through the cooperation of the Department of Agriculture, Doctor Meier has carried out preliminary experiments on the growth of algæ under controlled illumination and temperature conditions, a part of her work as National Research Council Fellow in the division. By the use of a large quartz spectograph, the modifications in growth rate or resulting death point may be observed comparatively for different wave lengths of light.

With the further cooperation of the Department of Agriculture, in connection with the crop physiology and breeding investigations of Doctor Swingle, of the Bureau of Plant Industry, Doctor Meier and members of the division have carried on researches on the effects of controlled radiation, humidity, and temperature on certain tropical and xerophytic plants. It was found possible to maintain conditions that yielded for date palms ten times greater growth rate than that of control plants in the greenhouse. Other interesting results were also obtained, which, if applicable to palms, as seems likely, would be of considerable practical importance.

In the field of pure physics and physical chemistry, the intensity distribution in the mercury spectrum has been determined directly,

and in cooperation with the Fixed Nitrogen Research Laboratory the spectra of HCl, HCN, and the halogen substitution products of benzene have been investigated in the region between the visible and 2μ. This work has been done by Doctors McAlister and Wulf and Mr. Liddel.

Several additional rooms have been prepared and equipped for the use of the division. The research field of the division is so wide and interesting both to pure science and agriculture that a considerable expansion of its resources and personnel is greatly to be desired.

INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE

In compliance with the resolution passed at the last international convention held in Brussels in July, 1922, the United States bureau of the catalogue has been kept in existence pending resumption of publication, and the compiling of necessary records of current American scientific publication has been continued so that they may be indexed when publication is resumed.

Every effort is being made by the United States bureau, through the chairman of the executive committee of the catalogue, to hasten the necessary reorganization, but the financial depression and other unfavorable conditions have so far prevented the development of a definite plan. Besides the necessary cooperation of the regional bureaus, all that is needed to put the enterprise on its feet is a capital fund of $75,000 to refinance the central editing and publishing bureau.

NECROLOGY

FRANK WIGGLESWORTH CLARKE

Frank Wigglesworth Clarke, honorary curator in the Division of Mineralogy, United States National Museum, since 1883, died at his home in Washington on May 23, 1931, in his eighty-fifth year. Doctor Clarke was chief chemist at the United States Geological Survey from 1883 to 1925, when he retired from active service.

The mineral collection in the National Museum had been recognized as a distinct entity for but a short time prior to Doctor Clarke's appointment as honorary curator. He laid the foundation for these now justly celebrated mineral and gem collections. In addition to his duties at the survey, he devoted much time and effort to the upbuilding and care of these collections, the early reports of the division testifying to his personal activities. His official retirement from the Government service did not affect his interest, which never flagged. He visited the department frequently, giving freely of the store of knowledge acquired by his long years of service.

Doctor Clarke was also greatly interested in the collection of meteorites, was instrumental in adding to it a number of specimens, and prepared a catalogue which was published as a part of the Smithsonian Report for 1886.

Doctor Clarke was a graduate of Harvard, had many honorary degrees, and was affiliated with several of the prominent scientific societies. He was the author of numerous papers, his Data of Geochemistry being a standard reference work.

Respectfully submitted.

C. G. Abbot, *Secretary.*

APPENDIX 1

REPORT ON THE UNITED STATES NATIONAL MUSEUM

SIR: I have the honor to submit the following report on the condition and operations of the United States National Museum for the fiscal year ended June 30, 1931:

The total appropriations for the maintenance of the National Museum for this period amounted to $830,394, an increase of $67,880 over the appropriations for the year 1930. Of this amount $12,909, together with a small additional sum secured by readjustment in our salary rolls, provided salaries for four additional employees, namely, an executive officer to be associate director of the United States National Museum, a clerk in the library, and two guards. The new positions provided mark a further advance in the building up of our staff, far too few in number at present for the needs of the Museum.

The second deficiency act for the fiscal year 1931 included $3,596 to cover increases in salaries occasioned by the Brookhart bill, which made adjustment in annual pay in certain minor grades. Congress further provided $11,875 for salary step-ups in connection with efficiency ratings, and $2,420 was received to cover reallocations made by the Personnel Classification Board.

The sum of $1,000 was added for the purchase of additional books for the Museum library, making $3,000 available annually for that purpose. There was further allotted an increase of $1,000 for printing and binding for the National Museum.

As noted in the report for last year, the second deficiency act for the fiscal year 1930 provided $3,500 toward the remodeling of the women's comfort room in the Arts and Industries Building, the expenditure of which came within the operations of the present fiscal year. Other additions under the heading of building repairs included $25,000 for the construction of overhead galleries for the study collection of mammals and $7,000 for fire-protective measures in the aircraft building.

In the appropriation for heating and lighting there was provided an additional $2,000 for the purchase of an electrically driven fire pump for fire protection in the Natural History Building.

The second deficiency bill for 1931 carried provision for $1,620 for an additional clerk and $10,000 for the preparation of preliminary plans for additions to the Natural History Building. These expendi-

tures will figure in the allotment of funds for 1932 and will be considered in the annual report for that year.

Requirements for additional funds for the National Museum follow lines indicated in previous annual reports. The question of further personnel continues to be one of paramount importance, as pressure for additional workers in the scientific, clerical, and custodial forces is constant and continued. Additions made to the staff in recent years have filled in at vital points, but many further positions remain to be provided before our organization can function with maximum efficiency. There are several large collections for which the Museum now has no curators. In some divisions assistants in professional grades are needed as understudies for older men who should be in a position to train successors in their particular fields. Clerical assistance is at a minimum everywhere and in several divisions no service of this kind is at present available. Further subprofessional workers also are needed and the work of the custodial services in our woodworking shops is behind. Temporary clerical and other assistance is provided as funds permit, but this is unsatisfactory, as there is much lost motion in giving necessary training to assistants who under civil service rules remain at most only six months. The gradual increase in staff that has come in recent years has been of great assistance, but additional employees in numerous places are still urgently needed.

Additions allotted for the purchase of books have been most useful, but the appropriation available for this purpose should be increased to at least $5,000 a year. Scientific books appear in steadily increasing numbers and at a cost considerably in advance of that of a few years ago, so that the money available for books is below our actual needs. Stimulus to the scientific work in the National Museum in the past few years is beginning to show in steadily increasing amounts of manuscript for publication as the result of researches on the part of the staff. There should be an increase in the funds for printing and binding to allow this material to be published promptly, in order that it may be made available for use by the many persons interested.

As in previous years our existing appropriations are taken up so largely with necessary routine expenditures that there is little money available that may be used in exploration and field work in connection with the National Museum. Many friends and correspondents now make large additions to our collections annually, and the Smithsonian Institution, from its private income, provides funds that are used in an exploration program of considerable importance. The Museum, however, should have in its appropriation adequate funds that would enable it to develop various field researches along logical and continuing lines.

ADDITIONS TO THE NATURAL HISTORY BUILDING

In the report for last year there was a discussion of the Smoot-Elliott bill authorizing the extension of the Natural History Building by adding wings at the east and west ends at a cost of $6,500,000, which was approved by the President on June 19, 1930. As mentioned above, the second deficiency bill for 1931 carried $10,000 for the preparation of preliminary plans for these additions. The Allied Architects Incorporated, of Washington, D. C., have been selected by the executive committee of the Smithsonian Institution to prepare preliminary plans which will be ready for consideration at the time this report is published. Briefly it is planned to add to the present building so that it will extend through the available space from Ninth Street to Twelfth Street, the additional construction to duplicate in general arrangement the present building, with the ground floor and third floor devoted to offices and laboratories and the two intermediate floors given over to exhibits. In so far as modern advances in museum design are found applicable to our needs, they will be incorporated in the plans, and various facilities not at present available will be arranged. It is desired to so schedule the appropriations covering this important matter that funds for the commencement of this work will be provided in the bill for the coming fiscal year. Delay will be highly embarrassing, since our collections in natural history have increased to a point where exhibition and laboratory space is now badly crowded, and under present conditions we must at times make refusal of valuable material that should be in the national collections. In recent years various expedients to provide more space have been adopted, until now we have reached our limit of resources without additional construction. It will be observed in further paragraphs of this report that additions to the exhibition and study collections contained in the Natural History Building in the present fiscal year have reached the vast number of nearly 1,000,000 specimens.

If the building program indicated can be carried out at this time there will be provided adequate quarters for the natural history collections. It must not be overlooked, however, that consideration must soon be given to further construction to house our highly valuable materials in arts and industries and in history.

COLLECTIONS

Additions to the collections of the National Museum during the fiscal year reached the total of 1,022,850 individual specimens, the major part of these coming, as in previous years, to the department of biology. The additions are far in excess of those of any previous

year in the history of the Museum and include individual specimens and collections of high value and great importance. Materials of various kinds received for examination and report during the year amounted to 1,297 lots, including many thousands of separate specimens. Gifts of duplicate materials to schools and other educational organizations included 7,384 specimens, while exchanges of duplicate materials with other institutions and individuals amounted to 33,471 specimens, for which there was received in return material needed for our collections. Loans to scientific workers outside of Washington amounted to 31,516 specimens.

Following is a digest of the more important accessions for the year in the various departments and divisions of the Museum.

Anthropology.—Alaska again has yielded most important accessions to the department of anthropology, the material coming through explorations financed by the Smithsonian Institution. Doctor Hrdlička this year visited the Kuskokwim Valley, the Alaska Peninsula, and adjacent islands, obtaining valuable materials from a region that so far has not been represented in our collections. Work was continued on St. Lawrence Island by Henry B. Collins, jr., who secured additional collections of value in connection with his previous materials from this area. Through our continuing program of exploration the Museum now possesses the most complete and valuable collection in existence of the ancient ivory culture of the Bering Sea region.

Of equal importance in this department has been the bequest of the American Indian collection of the late Victor J. Evans, of Washington. This collection, deposited by the executors of the Evans estate, Mrs. Victor J. Evans and Arthur L. Evans, numbers approximately 5,000 specimens, comprising costumes, weapons of war and the chase, pottery, basketry, domestic implements, oil paintings, and other valuable materials illustrative of the life of the American Indian, many of the objects being now impossible of duplication.

A further collection from west Africa was received as a gift from C. C. Roberts, this material representing the native tribes of Ashanti, Benin, and the Gold and Ivory Coasts. The Carnegie Institution of Washington presented a miniature plaster model of the stucco-covered Pyramid E–VII *sub* at Uaxactun in Guatemala, the oldest known example of Mayan architecture. Under the Bruce Hughes fund of the Smithsonian Institution there were obtained various antiquities from Mesopotamia and Persia for exhibition. As a gift from His Majesty George V of England there has come a chenille Axminster carpet made in 1851.

Textiles, and bone, wood, and stone implements from caves in northeastern Arizona occupied by prehistoric basket-maker and

Pueblo peoples were presented by Charles L. Bernheimer, of New York City. The Archeological Society of Washington deposited a collection of flint and bone implements from caves near Sergeac, Dordogne, France, collected in 1930 during work of the American School of Prehistoric Research. A series of stone artifacts recovered at Monasukapanough, a prehistoric Indian village in Albemarle County, Va., was presented by D. I. Bushnell, jr.

Biology.—The most important accession in the department of biology, and one of the most important from a scientific standpoint that has come to the Museum in recent years, was the Barnes collection of Lepidoptera, purchased by a special appropriation of $50,000 to the Department of Agriculture and transferred by that department to the National Museum. This collection, consisting principally of moths and butterflies from North America, was assembled by Dr. William Barnes, of Decatur, Ill., during a lifetime of endeavor at an expense of several hundred thousand dollars, and is rich in material of value to the specialist.

Dr. Paul Bartsch, curator of mollusks, traveling under the Walter Rathbone Bacon scholarship of the Smithsonian Institution, obtained extensive collections of mollusks from the West Indies. Additional important specimens in several groups have come from the field activities of Dr. David C. Graham in China and of Dr. Hugh M. Smith in Siam. Large and interesting series of specimens of various kinds were obtained by Dr. H. C. Kellers, United States Navy, while a surgeon on the United States naval eclipse expedition to the island of Niuafoou in the Pacific, being the first series of materials to be received by the Museum from that area. The National Geographic Society presented a large collection of birds, mammals, reptiles, and plants obtained by E. G. Holt, as leader of an expedition to the boundary region between Venezuela and Brazil. Much of this collection represents species not found hitherto in the national collections.

Doctor Wetmore, assisted by F. C. Lincoln, of the Biological Survey, obtained interesting collections, chiefly of birds and reptiles, in Haiti and the Dominican Republic. A collection of 3,800 eggs and 12 nests of North American birds was presented by Gov. C. D. Buck, of Delaware. A further collection of birds was obtained by Doctor Wetmore in Spain during field work in the summer of 1930. The division of birds received 16 genera new to its collections, as well as 330 species and subspecies not previously represented, a notable addition to these large collections. Two eggs of the California condor, a species near extinction in the wild state, were received from the National Zoological Park.

A large sailfish caught by Hon. William R. Wood near the island of Sonora, Pearl Island group, Panama, was presented by Mr. Wood to the Museum and has been mounted and placed on exhibition. It is of maximum size and is far larger than any other in our collections. The Bureau of Fisheries, United States Department of Commerce, transferred a large collection of fishes, principally from Chesapeake Bay and its tributaries.

Type specimens of annelids, sponges, sipunculid worms, and crustacea were presented to the division of marine invertebrates, while 114 types of helminths from Prof. Edward Linton, and the entire collection of Dr. W. G. MacCallum, of Johns Hopkins Hospital, with various other type specimens from collaborators, were added to the section of helminths.

Large collections of grasses from Japan, Madagascar, and elsewhere were transferred by the Department of Agriculture. A large series of specimens of cultivated plants came from the Brooklyn Botanic Garden.

Geology.—Thirty-two mineral species new to the collections were obtained during the year, mainly through purchase under the Roebling fund. There were obtained also under this fund a large mass of native silver and calcite estimated to contain 220 pounds of pure silver, and a section of a vein of similar material carrying 190 pounds of silver from the Keely mine in the cobalt district of Ontario, a large cut black diamond weighing 8.97 carats for the exhibition series, and the fossilized vertebra of an extinct reptile of large size that has been changed in fossilization to a fine quality of precious opal, a most unusual specimen. There was included also a flawless crystal of scapolite, said to be the largest crystal of this mineral yet found, two bowlders of precious jade, and a tourmaline weighing 40½ carats. The Chamberlain fund contributed to the Isaac Lea collection three Mexican opals of unusual color, a green tourmaline weighing 17.9 carats, five rubies from Siam, carved articles of jade, coral, rose quartz, and carnelian, and other interesting and valuable articles.

Specimens of nine meteorites, added to the collection through exchange or purchase, include one complete iron weighing 23 pounds from near Santa Fe, N. Mex., and other valuable examples. A complete set of the potash minerals of the Carlsbad (N. Mex.) deposits was secured with the assistance of Dr. W. T. Schaller through the courtesy of the United States Potash Co. Silver, nickel, and cobalt minerals and ores from various localities in Ontario were collected during field work by the assistant curator of mineralogy. A set of platinum ores from South Africa was obtained through the cooperation of the Geological Survey of the Union of South Africa.

Dr. A. F. Foerste contributed a series of 1,000 invertebrate fossils from the Silurian deposits of the Ohio Valley. Type material in Foraminifera was presented by Dr. J. A. Cushman, Mr. John W. Skinner, Mrs. F. B. Plummer, and Dr. T. Wayland Vaughan. Many valuable specimens, particularly of fossil mammals, were obtained from collections by C. W. Gilmore in the Eocene deposits of Wyoming, among them being several nearly complete skeletons that will eventually be mounted and placed on exhibition. There may be mentioned especially a nearly complete skeleton of *Hyrachyus*, a rhinoceroslike animal about the size of a tapir, a nearly complete skeleton of *Orohippus*, a small primitive horse, and two more or less complete crocodile skeletons; 38 turtles were obtained belonging to eight genera. Additional fossil horse material resulted from field explorations near Hagerman, Idaho, under Dr. J. W. Gidley.

The collection of fossilized tracks of animals was augmented by an unusually distinct dinosaur footprint from the Triassic of Virginia, presented by F. C. Littleton, of Aldie, Va. Fossil bird bones, types of new species described by Doctor Wetmore, were presented by Dr. E. L. Troxell, of Trinity College, Hartford, Conn. To the exhibitions in the section of paleobotany there came a fine example of a fossilized tree from near Natchitoches, La., presented by George Williamson through the interest of Prof. E. W. Berry.

Arts and industries.—An important accession in the aircraft section was a series of objects illustrating the first use of aircraft for military purposes in the United States, relating to captive balloons used during the Civil War, the collection having come from Prof. Thaddeus S. C. Lowe, organizer of the first military balloon section of the Federal Army. The airplane *Bremen*, the first heavier-than-air craft to make a nonstop flight westward across the north Atlantic, was deposited by the New York Museum of Science and Industry. For the section of land transportation there was secured a coachee, or light family carriage, made in Philadelphia about 1783 that there is reason to believe was owned at one time by General Washington at Mount Vernon. An original Concord stage coach was deposited by Will Rogers and Fred Stone. The Philadelphia Electric Co., through its president, William H. Taylor, presented a model of a section of the Conowingo hydroelectric generating station on the Susquehanna River near Conowingo, Md. Another valuable accession was an original horizontal stationary steam engine built in 1864 in the shops of the United States Military Railroad Department at Alexandria, Va., presented to the Museum by the Southern Railway system. This engine was in operation for 58 years.

The Pepperell Manufacturing Co. presented a model exhibit covering the growth and manufacture of cotton. A number of interesting

examples of hand-woven textiles from several individuals included a linen damask tablecloth woven in Vermont about 1780, the design being an illustration of Independence Hall, Philadelphia. This was presented by Mrs. Jennie Bancroft Alband. Dr. J. T. Lloyd presented a hand prescription balance used many years ago by pharmacists.

In the section of wood technology there were added important collections of woods from Jamaica collected by Gerrit S. Miller, jr., a set of woods from various localities obtained from the Field Museum of Natural History in exchange, and a series of 132 kinds of native woods presented by the Philippine Bureau of Forestry through A. F. Fischer.

For the Division of Graphic Arts there was obtained a miniature book, The Gospel of St. Matthew, printed from 2½-point type, the smallest type that has ever been cast. The printed surface of the page measures 1⅝ by 1⅛ inches and has approximately 540 words to a page.

The trustees of the Stephen H. Tyng Foundation of England have made the section of photography in the Smithsonian Institution the depository for duplicate pictorial prints procured by the foundation. The first installment of photographs from this source came during the year and will be followed by others. The works chosen are selected by the trustees of the foundation as representative works of outstanding pictorial merit produced by the photographers of any nation.

History.—In the antiquarian section a watch and a sword carried during the French and Indian War by Capt. Jeremiah Marston, of the British Army, were presented by Charles F. Clark. There came also a chair owned by Benjamin Franklin, a chair of President James Madison, a mahogany screen belonging to General Washington, and a cane made from a piece of one of the timbers of the U. S. S. *Constitution* by bequest from James C. McGuire.

The aluminum transit used by Admiral Peary during his north polar expedition in 1898 was received as a gift from Mrs. William Porter Allen. A uniform worn during the Spanish-American war by Maj. Gen. Leonard Wood was added to the collections as a gift by Mrs. Leonard Wood. An exceptionally interesting series of military uniforms and equipment was presented by the Rumanian Government through Dr. Andrei Popovici, secretary of the Rumanian Legation. A similar series of Turkish military arms and uniforms came as a gift from the Turkish Government through the Turkish ambassador, Mr. Ahmet Muhtar.

For the numismatic collection there were obtained examples of current coins from the Governments of Estonia, Italy, Poland, and

the Cameroons. A set of coins from Palestine was presented by P. Knabenshue, American consul general at Jerusalem. Numerous other coins from a large number of countries were transferred by the Department of State. The United States Treasury Department transferred to the national collections bronze copies of the gold medal awarded by Congress to Col. Charles A. Lindbergh in recognition of his services to the science of aeronautics and of the gold medal awarded by the Congress to Lincoln Ellsworth for his transpolar flight in the dirigible *Norge* in May, 1926. The philatelic collections received 7,855 specimens during the year, the majority having come by transfer from the Post Office Department.

CHANGES IN EXHIBITIONS

In the paleontological series of the Museum exhibition the most important addition has been the installation of the large dinosaur *Diplodocus longus*, collected at the Dinosaur National Monument, Utah. This specimen as mounted in our halls measures more than 70 feet in length and stands 12 feet 5 inches high, with the head and neck rising to a still greater height. The base has been so arranged that at the shoulders and at the hips visitors may walk through beneath the skeleton. This specimen, found embedded in a very hard and difficult rock, has required nearly six years for preparation.

An important change in the historical series has been the transfer of the costumes collection to a larger hall, where the cases containing the series of dresses of wives of the Presidents are now installed in a double row facing one another. This collection is one of the most popular in the Museum and shows to excellent advantage in the large space now available for it.

The numismatic collections have been transferred to the smaller room formerly occupied by the costumes, where the light is much better, allowing the coin and medal series to be viewed more readily, especially on days when artificial light is necessary. The philatelic collection also has been moved to a location where it is much more easily available.

EXPLORATIONS AND FIELD WORK

Field investigations carried on as usual throughout the year have been concerned with a wide variety of interests, and though mainly in the biological field, have included those researches concerned with man and with fossil animals of various kinds, as well as with various groups in botany and zoology. The work has been financed principally through grants from the general income of the Smithsonian Institution, assisted by contributions from interested individuals,

while certain projects were financed from special funds of the Institution. Limited assistance has been given from the annual governmental appropriations of the National Museum, but aid from this source has been relatively small and has concerned only a few of the various projects. Additional money that may be used for researches in the field is one of the principal needs of our organization.

A brief account of field work for the present year follows: During the months of July, August, and September, the assistant curator of ethnology, Henry B. Collins, jr., assisted by J. A. Ford, was engaged in field work on St. Lawrence Island in Bering Sea, in continuation of work begun earlier in the season. In 1928 and 1929 Mr. Collins's excavations on Punuk and St. Lawrence Islands revealed the existence of a prehistoric phase of Eskimo culture ancestral to the modern type of that region and derived apparently from a still earlier phase, known to students as the old Bering Sea culture. Stratigraphic excavations were made this year at Gambell and a long succession of cultural changes was revealed in detail as one village midden after another was trenched. Through this an excellent chronology was established on the basis of stratigraphy, the evidence of the old beach lines, and the demonstrable succession of art styles on implements, principally harpoon heads of walrus ivory. Incidental to this work Mr. Collins took occasion to secure an excellent collection of birds from this island, the bird life of which has been comparatively little known. The active interest of the Revenue Cutter Service in this work continued and was of invaluable assistance, particularly the transportation furnished on the cutter *Northland* to areas otherwise inaccessible. Cooperation from this source has been highly appreciated.

The curator of ethnology, Herbert W. Krieger, engaged in a reconnaissance of an archeological nature in the Republic of Haiti, this work being carried on from January to May, 1931, when the approach of the rainy season brought it to a close. The present population of Haiti has no history or tradition regarding the early Indian occupants of the island, and is therefore of no assistance in locating former Arawak or Ciboney village sites and kitchen middens, so that one has to rely on Spanish and French narratives for the ethnological and historical introduction useful in this work. The reconnaissance was highly successful in determining the distribution of former Arawak and Ciboney village sites, and it was found that scattered groups of each type occupied at different times much of the habitable portions of the island. A check was made also on data from Spanish writers who gave differing accounts with regard to the former presence of a troglodytic population in the isolated mountains of the southwestern peninsula.

As a further important result, this season's investigations established the identity of the Samaná cave culture, investigated by a Smithsonian expedition in 1928, with the large shell middens on Île á Vache, on the Caribbean coast of Haiti. The same primitive, non-agricultural, non-Arawak Ciboney apparently are also responsible for the large middens consisting primarily of conch shells (*Strombus gigas*) recently discovered by Doctor Wetmore on Beata Island off the southern coast of Barahona Province, Dominican Republic. Cumulative evidence obtained during the current year and from previous Smithsonian expeditions links the culture of the West Indies with the Arawakan tribes of Venezuela and of the Guianas. There is also data to show that there was no direct tribal contact of these island Arawak with the tribes of southern Florida, although culturally in many ways they were closely associated. There seems to have been a vast overlapping of culture traits of the southeastern United States from the south, these trait complexes centering about the cultivation of maize and the production of pottery. In so far as cassava (yucca) formed a staple food, the former aboriginal culture traits are associated with those of the South American forested tropical lowlands.

As in former years, the expedition headed by Mr. Collins was made possible by a Smithsonian grant, while that of Mr. Krieger was financed by Dr. W. L. Abbott.

From April 21 to June 6, 1931, the assistant curator of archeology, F. M. Setzler, was engaged in archeological investigations in Texas, arranged in cooperation with the Bureau of American Ethnology of the Smithsonian Institution. After briefly examining several sites along the Gulf coast, he excavated four caves and one rock shelter in Presidio County and visited several other caves in that vicinity. From one large cave examples of aboriginal basketry, matting, cradles, sandals, and other materials were recovered. Although this site is only 150 miles east of a marginal basket-maker culture, no trace was found of these early Southwestern people. The material exhumed by Mr. Setzler differs in some respects from any other in the Museum, and more research will be required before it can be identified definitely. He has prepared a preliminary report on this field work.

Except for two weeks in October, 1930, J. Townsend Russell, jr., collaborator in Old World archeology, spent the year in Europe, where he continued archeological studies and participated in the excavations of the American School of Prehistoric Research at Castel Merle, in the Dordogne, France, and in Czechoslovakia. Toward the close of the fiscal year Mr. Russell was active in details looking toward a cooperative undertaking with the University of Toulouse for excavation of prehistoric sites in France, which will add de-

cidedly to the collections of the National Museum, in a field from which our Institution previously has had very little. These investigations are financed by a special fund for work in Old World archeology.

Dr. Aleš Hrdlička, curator of physical anthropology, left in May on a fourth expedition to Alaska, for the purpose of obtaining measurements and, if possible, casts of the few remaining full-blood Aleutians. He expected to work in the region of supposed contact between the Eskimo, the Aleut, and the Indian, and to examine the various mountain passes between Bering Sea and Cook Inlet and the Gulf of Alaska, through which migrations of early man from the Bering Sea area southward may have been possible.

Dr. Paul Bartsch, through the Walter Rathbone Bacon Traveling Scholarship under the Smithsonian Institution, continued field work in the West Indian islands in a study of the terrestrial molluscan fauna of this area, completing a program of travel initiated two years ago. This year efforts were focused on the southern Bahamas, the islands off the south coast of Cuba, and the Cayman group. Doctor Bartsch was accompanied by three assistants, Harold Cluttick, a student of George Washington University; Ray Greenfield, who had been with him two years ago in Cuba; and Alva G. Nye, jr., of Washington. Harold Peters of the Bureau of Entomology, also accompanied the party to collect specimens of avian parasites. The party left Miami, Fla., on June 9, 1930, in the *Island Home*, a 33-ton, shallow-draft vessel. Work was carried through the islands and cays of the southern Bahamas until August 6, and then the party explored the wonderful molluscan fauna of Great Inagua Island, which proved by far the richest of all the Bahamas. On reaching Guantanamo, Cuba, the *Island Home* was pronounced unseaworthy, and another boat the *José Enrique*, a 35-ton sloop with an auxiliary 22 horsepower gasoline engine, was chartered at Santiago. On August 28 the party continued through the keys along the south coast of Cuba, and from September 10 to September 17 was occupied on Cayman Brac, Little Cayman, and Great Cayman islands. Sails were then set for Cuba, and until September 24 the keys along the coast from Cayo Largo to the Isle of Pines were searched. On September 29 the port of Batabano, Cuba, was reached and the collections were shipped by rail to Habana. The expedition returned to Washington on October 3. This cruise yielded a larger amount of molluscan material than any of the previous trips, no less than 250,000 specimens of mollusks being secured, together with many observations on molluscan faunistic relations. Large collections in other groups were also obtained, among them 925 bird skins and 596 reptiles and amphibians, besides a number of live animals, principally reptiles, for the National Zoological Park.

The Rev. David C. Graham, whose explorations in western Szechwan, China, and the neighboring regions of Tibet, have been a feature of these reports for many years, continued work near Suifu, and forwarded to the National Museum large and important collections numbering in all 62,000 specimens, the greater part consisting of insects. His main trip during 1930 was an excursion into the unknown and difficult country south of Tatsienlu.

Dr. J. M. Aldrich, in continuation of work which has extended over a period of many years, spent part of June and July, 1930, in making collections of Diptera in Idaho, Washington, California, and Colorado. He visited many type localities, and his collections for this season include a larger number of interesting forms than he has obtained before in a like period in the United States.

Dr. Waldo L. Schmitt continued his investigations of the marine fauna at the Carnegie Marine Biological Station, Tortugas, Fla., from July 9 to August 8, 1930, through the cooperation of the Carnegie Institution of Washington, undertaking this year a preliminary investigation of the deeper water readily accessible to the laboratory. Among the prizes brought back were three specimens of the giant isopod *Bathynomus*, the largest specimen being 10½ inches long, and a new portunid crab of the genus *Benthocascon*, a group heretofore known only from a single specimen taken in the Andaman Sea, Indian Ocean.

Dr. H. C. Kellers, United States Navy, through the courtesy of the Naval Observatory and the friendly cooperation of the Navy Department, was again detailed to act as representative of the Smithsonian Institution for the purpose of making biological collections during the United States Naval Observatory eclipse expedition to Niuafoou, nicknamed "Tin-can Island," a partly submerged volcanic crater situated between Samoa and Fiji. His collections include 100 bird skins and over 7,000 alcoholic specimens of various kinds.

Ernest G. Holt, under the auspices of the National Geographic Society, continued explorations along the Venezuelan-Brazilian boundary and returned with valuable collections, principally of birds, reptiles, amphibians, and plants which have been presented to the National Museum by the society. In the preliminary examination of this material many forms not before represented in our collections have been found. The material is particularly welcome, as the Museum has previously had but little from this region.

Because of association in the work of the National Herbarium it is proper to mention field investigations by Mrs. Agnes Chase, of the Department of Agriculture, who collected in the Eastern Shore region of Maryland for the purpose of studying the distribution of

certain coastal plain species of grasses, and by Jason R. Swallen, who spent about three months in the region from Tennessee to Texas and northeastern Mexico studying the ranges of grasses.

Gerrit S. Miller, jr., visited Jamaica from February to April with the special object of determining whether or not bones of rodents or other mammals that are now extinct might be found in the village middens of the pre-Columbian Arawaks. Several kitchen middens were investigated and much material bearing on the food habits of the aboriginal inhabitants was obtained. Miscellaneous collections of various kinds also were made, particularly of plants, reptiles, and Arawak artifacts.

Dr. A. Wetmore, accompanied by Frederick C. Lincoln, of the Bureau of Biological Survey, collected from the middle of March until the end of May in Haiti and the Dominican Republic, continuing the biological survey of Hispaniola that has been under way for several years. The first work was done in the region of Fort Liberte in the north, where they were accompanied by S. W. Parish and by M. W. Stirling, Chief of the Bureau of American Ethnology, who were traveling with Mr. Krieger to examine archeological sites that the latter had under investigation in that area. Returning to Port-au-Prince, Doctor Wetmore, through the courtesy of the United States Marine Corps, made a reconnaissance by airplane of the La Hotte Mountains of southwest Haiti, securing information that governed later travel by pack train in this area and the ascent of Pic de Macaya, the highest mountain in this complex. On arrival again at the coast a visit was made to Ile a Vache to supplement collections made there last year by the Parish expedition.

Returning to Port-au-Prince, Doctor Wetmore and Mr. Lincoln traveled by auto through the mountains to Barahona, in the Dominican Republic, where they secured a small sloop and continued to Beata Island, a little-known island where new forms of birds, reptiles, and land shells were obtained and an extensive series of Indian shell mounds was examined. Work in the Dominican Republic was made possible through letters given by General Rafael Trujillo, President of the Republic, to whom all thanks are due for this invaluable assistance.

Edward P. Henderson, assistant curator of mineralogy, under the auspices of the Roebling fund, spent a month in the well-known silver and nickel camps of Ontario, Canada. Starting from Toronto, he first visited the cobalt district, 300 miles to the north, where rich silver masses and their associations were acquired. Sudbury, the most important nickel district in the world, was next visited. Here a quantity of nickel ore and its minerals was obtained. The pegmatite dikes of the Province at Bancroft yielded recently described

materials lacking in our collections. The hearty cooperation of the mining companies, quarry owners, and the staff of the Royal Ontario Museum of Mineralogy was largely responsible for the success of the trip. Later in the year Mr. Henderson made a brief trip to some of the noted mineral localities in North Carolina to obtain material needed for the study of particular problems.

Dr. C. E. Resser spent about four months in the field, working first in the Grand Canyon, in Arizona, under the auspices of the Carnegie Institution. The second phase of his work led diagonally across the State of Arizona on a rapid reconnaissance, followed by a return to the Grand Canyon for further studies. In this he was accompanied by Dr. A. A. Stoyanow, of the University of Arizona, and by members of the Park Service, who aided in his investigations. Early in July, starting from Salt Lake City, where Dr. R. Endo became a member of the party, work began on the local geology about Delta, Utah, where the party was accompanied by Frank Beckwith, with a profitable visit to Zion Canyon. Thence the course lay north to the Tetons and other places in the vicinity of Yellowstone National Park. During investigations at those places, Dr. and Mrs. Curt Teichert joined the party. Rain interfered materially with travel and work; and since matters of moment requiring attention arose at the Museum, work was closed for the season. Travel from Salt Lake City was by truck, the entire trip home being made by this means. The season as a whole was most profitable in the knowledge gained of the various geologic strata, although not many fossils were secured, as the strata studied are for the most part nonfossiliferous.

Since the field exploration in charge of C. W. Gilmore extended into the present year, but brief mention was made of it in last year's report. This exploration in the Bridger (Eocene), in the Bridger Basin, southwestern Wyoming, met with unusual success in the acquisition of large and representative collections. Some of the outstanding specimens have been mentioned elsewhere in this report. The collection as a whole gives the division a good representation of the Bridger fauna and in all probability contains many undescribed forms, being particularly rich in mammals. Its value was further enhanced by the cooperation of Dr. W. H. Bradley, of the United States Geological Survey, who secured the necessary data for a large-scale map, which, with his geological sections, insures the accurate placing of the specimens both geographically and geologically. George F. Sternberg, as in previous seasons, rendered efficient service, and George B. Pierce ably assisted as field assistant. At the close of the fiscal year Mr. Gilmore, again accompanied by Mr. Sternberg, was in the field in Montana and Wyoming.

Although work at the fossil locality near Hagerman, Idaho, was very successful in the season of 1929, the results of the 1930 expedition under Dr. J. W. Gidley exceeded it in both quantity and quality, as some of the best material found in the deposit was obtained near the close of operations. Camp was established early in May and work was begun where operations had closed the previous season. Two months' additional work fully confirmed the opinion that this fossil bone deposit is one of the most important discoveries in the field of vertebrate paleontology in recent years. Associated with the abundant horse remains were found bones of beaver, otter, mastodon, peccary, and others. The collecting for the season was brought to a close early in July, but the field was still so promising that a third expedition was undertaken in the spring of 1931, under N. H. Boss, chief preparator in the division of vertebrate paleontology. This party was still in the field at the close of the fiscal year so that its results will come properly in the report for next year.

BUILDINGS AND EQUIPMENT

Usual routine repairs have been necessary in connection with the buildings of the National Museum to keep them in proper condition. In the Natural History Building the auditorium was painted, as were also the corridors surrounding it. A considerable amount of painting was done in ranges in halls on the first and second floors, many of which had not been painted since the completion of the building nearly 20 years ago. Metal and wooden window frames were painted, as were also the walls and floors of the engine room. A revolving door was installed at the north entrance, a needed improvement particularly in the winter season.

Steel galleries were erected in two ranges on the ground floor and in certain adjacent rooms that provide housing for the study collections of mammals which have been stored temporarily in two exhibition halls on the second floor. Necessary plans and specifications for this work were prepared by the engineering division of the Office of Public Buildings and Public Parks. The work of erection of the galleries began on April 15, 1931, and was well along toward completion at the close of the fiscal year.

In the Arts and Industries Building various exhibition halls were reconditioned during rearrangement of some of the exhibits, and the women's comfort room was enlarged and remodeled. In the Aircraft Building a sprinkler system and other fire safeguards were installed. The building was repainted within and without and a concrete base was built at the bottom of the sloping sides around the entire exterior.

In the rooms occupied by the National Museum in the Smithsonian Building walls and ceilings in 12 rooms in the division of plants were repainted, and insulating material to control excess summer heat and excess heat radiation in winter was installed in the ceiling in the main herbarium hall.

The power plant was in operation from September 29, 1930, until May 27, 1931. The consumption of coal during the year was 3,329 tons, at an average cost per ton of $5.65. The amount required was somewhat less than that of last year, due primarily to the mild winter, and secondarily to the fact that some of our electric current was purchased from the Potomac Electric Power Co., thus relieving the load on the boilers at such times as all of the exhaust steam was not needed for heating the Natural History Building. The Steamboat Inspection Service has examined the boilers and the elevators have been regularly inspected by the District of Columbia inspector. The total electric current produced amounted to 613,000 kilowatt-hours, manufactured at a cost of 1.78 cents per kilowatt-hour, including interest on the plant, depreciation, repairs, and material. In addition electric current to the amount of 73,250 kilowatt-hours was purchased and used in the exhibition halls of the Arts and Industries Building. Needs for electrical current are steadily increasing, particularly to provide favorable lighting in our exhibition halls during dark days in winter, and increased purchases will be required in the future.

The ice plant manufactured 406.8 tons of ice, at an average cost of $1.67 per ton, a reduction from the expense for the previous year. With the plant operating at full capacity it is not practicable at the present time to manufacture the entire amount of ice required during the hottest weather of summer, so that it is necessary to purchase a certain amount at that time.

During the year 20 exhibition cases and bases, 439 pieces of storage, laboratory, and other furniture, and 1,667 drawers of various kinds were added, the greater part of these being manufactured in our shops.

MEETINGS AND RECEPTIONS

The lecture rooms and auditorium were used during the present year for 103 meetings, covering the usual wide range of activities Government agencies that utilized these facilities for hearings, meetings, lectures, and other special occasions included the Bureau of Agricultural Economics, the Plant Quarantine and Control Administration, the Forest Service, the Bureau of Dairy Industry of the Department of Agriculture, and the United States Public Health Service. In addition a meeting was arranged by the Director of

Scientific Work of the Department of Agriculture for an address by Dr. Samuel C. May, of the University of California, on the workings of the Government. There were various conferences held from June 16 to 23 in connection with the Fifth National Farm Girls and Boys 4-H Club Camp. The Department of Agriculture Graduate School also utilized the auditorium for an address by Dr. R. A. Fischer, of the Rothamsted Experiment Station, on statistics. The scientific societies that met regularly in the auditorium or small lecture room included the Vivarium Society, the Entomological Society of Washington, the Society for Philosophical Inquiry, the Anthropological Society of Washington, and the Helminthological Society of Washington. Meetings were also held by the Wild Flower Preservation Society (Inc.), the Audubon Society of the District of Columbia, the Biological Society of Washington, and the Potomac Garden Club.

The National Association of Retired Federal Employees held regular meetings during the year, and there was one meeting of the Smithsonian Relief Association. The National League of Commission Merchants met on December 17 under the auspices of the Bureau of Agricultural Economics for the purpose of explanation of the provisions of the recently enacted perishable agricultural commodities act. The Maryland-Virginia Farmers' Marketing Association met on February 12 to discuss plans for a farmers' market. Dr. Arthur A. Allen, of Cornell University, lectured on February 23 before the Audubon Society of the District of Columbia on native birds and their advantages on golf courses. Dr. Raymond L. Ditmars lectured before the Biological Society of Washington on February 28 on reptiles.

The American College of Physicians during its fifteenth annual clinical session met in the auditorium on March 28 for an address by Dr. Aleš Hrdlička on the diseases of the human race.

On April 13 there was held the eighth national and sixth international oratorical contest for the Evening Star area for contestants from private and parochial schools of Washington. This was followed on May 8 by the second zone finals for the same contest.

On April 28 the Bureau of Dairy Industry, United States Department of Agricultural, held a meeting of the International Association of Milk Dealers. On May 18 the Carnegie Institution of Washington arranged an address by Sir James H. Jeans, of the Royal Society of London, on Out in the Depths of Space. On May 19 there was an address by Dr. M. A. Crossman, of the Republic Research Corporation on Nitriding before the metallurgical advisory committee of the Bureau of Standards and the Washington-Baltimore Chapter of the American Society for Steel Treating.

The seventh annual national spelling bee was held in the auditorium on May 26, when the first prize of $1,000 was won by Ward Randall, of White Hall, Ill.

MISCELLANEOUS

The exhibition halls of the National Museum were open during the year on week days from 9 a. m. to 4.30 p. m., except that the Aircraft Building, as has been noted, was closed for repairs for eight months during the year. Our Museum halls were also open on Sunday afternoons from 1.30 p. m. to 4.30 p. m., with the exception of the Aircraft Building. All buildings remained closed during the day on Christmas and on New Year's.

The flags on the Smithsonian and Museum Buildings were placed at half mast from 1.15 p. m. April 9 through April 11, out of respect for the late Speaker of the House of Representatives, the Hon. Nicholas Longworth. During the forenoon of Memorial Day the flags also were held at half-mast. Visitors for the year totaled 1,669,140, a decrease of a little more than 230,000 from the record of the preceding year, this difference being due partly to the fact that the Aircraft Building was closed for a considerable part of this period. Attendance in the several buildings in the National Museum was recorded as follows: Smithsonian Institution, 258,616; Arts and Industries Building, 731,186; Natural History Building, 631,498; Aircraft Building, 47,840. The average daily attendance for week days was 4,452, and for Sundays 5,472.

During the year the Museum published 7 volumes and 41 separate papers, while the distribution of literature amounted to 86,680 copies of its various books and pamphlets. Additions to the Museum library, obtained partly by exchange, partly by donation, and partly by purchase, included 2,528 volumes and 832 pamphlets, an increase over those of the previous year. The library of the National Museum, as separate from that of the Smithsonian Institution proper, now contains 79,407 volumes and 109,129 pamphlets. Much progress was made during the year in the arrangement and cataloguing of these collections, not only in the main libraries but also in the 36 sectional libraries of the organization. Duplicate volumes in our series have been assembled and many have been distributed to other organizations, either as gifts or as exchanges.

On March 5, 1931, John E. Graf was appointed associate director of the National Museum under the assistant secretary. Mr. Graf came to the Museum by transfer from the Department of Agriculture, where he had long been connected with the administration of the Bureau of Entomology, in recent years as assistant chief.

In the department of anthropology the former divisions of American archeology and of Old World archeology were consolidated on February 1, 1930, as a division of archeology, under Neil M. Judd as curator.

On February 1, 1931, Dr. A. J. Olmsted, chief photographer, was appointed assistant curator of the section of photography under the division of graphic arts.

Frank M. Setzler was appointed assistant curator of the division of archeology, August 16, 1930, and Gustav A. Cooper, assistant curator in the division of stratigraphic paleontology on October 20, 1930.

Following the retirement of Dr. Marcus Benjamin, Paul H. Oehser was appointed Museum editor on April 16, by transfer from the Department of Agriculture. Miss Gladys O. Visel was transferred on March 1 from the National Gallery of Art to become clerk in the Museum editorial office, and Frank W. Bright, of the Government Printing Office, on March 2 succeeded J. C. Proctor, retired, as compositor in the branch printing office of the Museum. Effective March 1, 1931, the editorial work of the entire Institution was consolidated in one central office under W. P. True, editor of the Smithsonian Institution.

January 1, 1931, Lester E. Commerford became assistant chief in the office of correspondence and documents.

The following employees left the service through operation of the retirement act: Dr. Marcus Benjamin, editor, on January 31, 1931, after a service begun April 1, 1896. During Doctor Benjamin's incumbency there were published under his editorship 31 annual reports, 59 volumes of proceedings, and 106 bulletins, many of the latter in several volumes, a long and remarkable record. John Claggett Proctor, printer, retired February 28, 1931, after a service of 46 years.

On August 31, 1930, the following left the service through operation of the retirement act: Dr. James E. Benedict, assistant curator in the department of biology, after over 40 years of active service in many varied fields in the Museum, particularly with regard to our exhibits in biology; Miss Nellie H. Smith, clerk in the administration office since April, 1890; J. W. Scollick, osteologist since July, 1884; John S. Prescott, electrician since January, 1896; William O. Murray, skilled laborer, after 11 years' service. John M. Mohl, electrician's helper, was retired on March 31 after over 33 years of service. Jerome Patterson, watchman, was retired for disability on June 17, 1930. Through death the Museum lost three workers from its active roll, Miss Narcissa Owen Smith, January 31, 1931; Paul Schilke,

watchman, on January 1, 1931; and Robert L. Belt, watchman, on February 4, 1931.

From its honorary list of workers the Museum lost by death Isobel H. Lenman, honorary collaborator in ethnology, on February 3, 1931. Dr. Frank Wigglesworth Clarke, honorary curator of mineralogy since December, 1883, died May 23, 1931. There may be mentioned further the death on November 2, 1930, of Dr. Oliver Perry Hay, internationally known for his work on paleontology, who, though never officially attached to the staff, carried on his researches in the Museum for nearly a quarter of a century.

Respectfully submitted.

ALEXANDER WETMORE,
Assistant Secretary.

Dr. C. G. ABBOT,
Secretary, Smithsonian Institution.

APPENDIX 2

REPORT ON THE NATIONAL GALLERY OF ART

SIR: I have the honor to submit herewith my report on the operations of the National Gallery of Art for the fiscal year ending June 30, 1931.

PRESENT DISTRIBUTION OF THE ART COLLECTIONS

In 1920 the art collections of the Institution, so far as they had been assigned to the care of the recently established National Gallery of Art, were installed in the central skylighted hall of the new Natural History Building of the National Museum. This hall extends from the rotunda on the south to the north front of the building, the windows of which look down on Constitution Avenue. Permanent screens were introduced in this hall affording excellent hanging space for the paintings. The disposition then made of the numerous groups of art works has been changed from time to time and important groups have been added. During the 10 years that have passed slight record of the placement of these collections has been kept, and it may be advisable to indicate here briefly the present distribution.

The Harriet Lane Johnston collection, an early bequest of great value, comprising paintings and historical documents, is installed in the northwest long room of this hall. Across the hallway from this collection, occupying the northeast long room, is the Ralph Cross Johnson gift of rare European old masters, presented in 1919.

Distributed through a number of rooms, including the large central gallery, are numerous groups of works by our American masters. Prominent among these is the great gift of 152 paintings, representing 106 artists, by William T. Evans, of New York. The Alfred Duane Pell collection of art objects of varied types and much interest is accommodated in the north extension and hallway at the north end of the hall. A number of the larger works of both paintings and sculptures are installed in available spaces in the rotunda.

On the ground and first floors are several groups of historical paintings. First among these is the group of World War portraits. Shortly after the close of the World War a number of Americans organized a national art committee, the purpose of which was to obtain portraits for the National Gallery of Art of a number of distinguished leaders of the allied forces. Entering this hall from the

north the visitor finds himself face to face with many of the outstanding personages of the great war—kings, queens, presidents, soldiers, statesmen, and others—whose faces and achievements are familar to the peoples of every civilized nation.

Occupying the walls of a large room on the second floor is the collection of portraits of survivors of the Civil War painted from life by Walter Beck 50 years after the close of the war. Associated with this group are two other World War groups, the John Elliott collection of portraits of young Americans who entered the air service of France before the United States had decided to take part in the war, many of these losing their lives in the struggle; and a very interesting collection of sketches of prominent World War personages made by John C. Johansen for use in executing his great work, the "Signing of the Peace Treaty, June 28, 1919," now occupying the west wall of the lobby. In the lobby are assembled also numerous busts and other works of sculpture, while a number of paintings embellish available spaces on the walls of the stairway. The Freer collection, the most important single unit of the gallery's possessions, occupies a commodious building immediately west of the Smithsonian provided by the donor. The recently acquired Gellatly collection of art works of wide scope and great value is retained, as originally installed by the donor, in the Heckscher Building, New York City, due to lack of gallery space in Washington; while the large collection of drawings by John S. Sargent (1856–1925), a gift from his sisters Miss Emily Sargent and Mrs. Violet Ormond, remain in storage at the Corcoran Gallery of Art for the same reason.

THE GALLERY COMMISSION

The tenth annual meeting of the National Gallery of Art Commission was held in the Regents' room of the Smithsonian Institution at 10.30 o'clock, December 9, 1930. The members present were: Gari Melchers, chairman; Frank J. Mather, jr., vice chairman; W. H. Holmes, secretary; Herbert Adams, James E. Fraser, J. H. Gest, John E. Lodge, Charles Moore, E. W. Redfield, and Dr. Charles G. Abbot, ex officio.

The minutes of the last annual meeting, held December 10, 1929, were read and approved. The annual report of the secretary of the commission reviewing the activities of the gallery for the calendar year 1930 was read and accepted.

After careful inspection, a portrait of Commodore Stephen Decatur, by Gilbert Stuart, bequeathed to the National Gallery by the late William Decatur Parsons, and an enamel watch by Loulinie & Legandroy, Geneva, Switzerland, bequeathed to the Institution by Miss Charlotte Arnold H. Bryson, were accepted by the commission.

THE ABNEY BEQUEST

Doctor Abbot made the following statement: Under the will of Mrs. Mary Lloyd Pendleton Abney, of New York, dated May 16, 1928, the following bequest is made:

Clause—

Seventh. To the National Gallery, at Washington, D. C., heretofore known as the Corcoran Gallery, I give and bequeath the four Key family portraits said to have been painted by Peter Lilly and Godfrey Kneller, to wit, portraits of Mrs. John Zouch (Lady Zouch); Michael Arnold; Ann Arnold, wife of Michael Arnold and daughter of Thomas Knipe; and Susan Gardner, the mother of John Ross; and I give and bequeath also the portrait of Mary Tayloe Lloyd, wife of my grandfather, Francis Scott Key, painted by Godfrey Kneller, and her miniature, painted by Robert Field; the Key table, and two chairs which were used by Francis Scott Key; the Lloyd mahogany table and four old chairs and old knocker from the Francis Scott Key house, which was at Georgetown, by the Arlington Bridge, now known as the Key Bridge. * * *

(Note by the executrix: Mrs. Abney, while living donated and delivered to others the furniture mentioned in clause 7, and the "old knocker" was not found among her effects.)

[Doctor Abbot, Secretary of the Smithsonian Institution, has been informed by Mrs. Jane F. Brice, the sister and executrix of Mrs. Abney, that the Corcoran Gallery has executed waiver to any right it might have to the bequest, and the matter was presented by her to the director of the National Gallery, with the oral request, by her husband, to have the National Gallery also execute a waiver of its rights.

The matter was laid before the permanent committee of the Board of Regents. Having in mind the probable value and interest of the objects, both from the artistic and historical standpoints, and in view of the national character of the gallery, the committee did not feel that on the ex parte statements of the executrix, who is also the residuary legatee under the will, they could waive any rights that the gallery might have, without a proper adjudication of the matter, and so informed Mrs. Brice. The matter is now before the court.]

THE RANGER COLLECTION

At the request of the chairman, James E. Fraser read a report that had been made to the council of the National Academy regarding the selection of the Ranger pictures to be retained by the National Gallery.

After full discussion in which it developed that the commission was not to be asked to take any official action, Mr. Gest submitted the following resolution, which was adopted:

Resolved, That the thanks of the commission be tendered Mr. Fraser for his comprehensive statement and that the paper be included in the records of this meeting as a matter of information.

THE WASHINGTON BICENTENNIAL CELEBRATION

Herbert Adams brought up the matter of the Washington bicentennial celebration planned for 1932, saying that the Sculpture Society had suggested a comprehensive scheme for the exhibition of paintings and sculptures pertaining to Washington. The matter was discussed at some length, and Mr. Moore stated that the Bicentennial Commission had this matter in hand and that the commission would probably address a letter to the secretary of the Institution on the subject.

ELECTIONS

The secretary was directed to cast a ballot for the reelection of Gari Melchers, chairman; Prof. F. J. Mather, jr., vice chairman; and William H. Holmes, secretary.

The secretary called attention to the fact that the terms of three members of the commission would expire on December 14. Mr. Fraser submitted the following resolution which was adopted:

Resolved, That the commission recommend to the Board of Regents the reelection for the succeeding term of four years of the following members: Herbert Adams, Gari Melchers, and Charles Moore.

There being no further business to come before the meeting, the commission adjourned at 12 o'clock.

EXHIBITIONS HELD IN THE GALLERY

1. A collection of 78 masterly water colors of Asiatic, European, and American Indian subjects, by William Spencer Bagdatopoulos, the Greek-English artist, was shown in the two northern small rooms of the gallery October 30 to December 22, 1930. A catalogue was supplied by the gallery.

2. A memorial exhibition of water colors of Egyptian, Greek, French, Italian, and English subjects, by Henry Bacon, was installed in the large middle room of the gallery March 14 to April 30, 1931. The collection proved of exceptional interest. A catalogue was supplied by the gallery.

3. The fortieth annual exhibition of the Society of Washington Artists, the second held in the gallery, occupied the walls in the central group of rooms, main floor of the gallery, February 1 to March 1, 1931. The exhibition included 162 paintings and 21 works of sculpture and received flattering public attention. An illustrated catalogue was supplied by the society.

THE GALLERY CATALOGUE

Two catalogues of the art collections of the Institution have been published as Bulletin 70 of the United States National Museum, the first edition in 1906 and the second in 1916, by Richard Rathbun, assistant secretary of the Institution, and two catalogues of the Na-

tional Gallery of Art, the first edition in 1922 and the second in 1926, by the director.

During the year the director has devoted his energies largely to the preparation of a comprehensive catalogue of the art works of the Institution, giving especial attention to works of painting and sculpture. This catalogue does not include the wide range of minor art works usually included in museums of art; and since no definite line has yet been drawn between assignments to the gallery and those that properly pertain to the Museum, the limits of the catalogue must remain indefinite.

The form of the catalogue has received very especial attention. The cards used measure 8 by 10½ inches, corresponding thus to the standard manuscript sheets of the Institution. Each unit or card of the catalogue comprises two somewhat rigid sheets, one devoted to a record of the source of the work and to the biography of the artist and the other to a picture of the work itself. Some 600 cards are now completed. The portrait group comprises about one-third of this number. These are separately assembled owing to the anticipation that the Institution may find it possible, in the near future, to organize a national portrait gallery, and possibly at least to print separately this portion of the catalogue of the art works of the Institution.

Portraits of several types are included in the catalogue approximately as follows:

1. Oil paintings.
2. Water colors.
3. Pastel and related technique.
4. Engravings.
5. Sculpture.

PROFESSOR HOLMES AND THE SMITHSONIAN INSTITUTION

It may not seem out of place, since the director's official life is nearing its close, to record here briefly his connection with the Smithsonian Institution. Just 60 years ago he entered the north door of the Institution an entire stranger and proceeded to sketch a brilliantly colored bird installed in one of the Museum cases. He was observed at this work, and as a result was soon engaged in drawing natural history specimens for the resident professors. In 1872 he was appointed artist to the survey of the Territories and took part in the survey of the Yellowstone region. In 1874 he was appointed assistant geologist on the survey then working in Colorado and has found his services continuously called for in the fields of both science and art. Advancing step by step and from year to year in both branches, he finds himself to-day a member of the National Academy of Sciences and Director of the National Gallery of Art. His varied

activities in these fields are recorded in upward of 50 annual reports made to the departments with which he served.

ART WORKS RECEIVED DURING THE YEAR

Accessions of art works by the Smithsonian Institution, subject to transfer to the National Gallery on approval of the advisory committee of the National Gallery of Art Commission, are as follows:

Portrait statue (heroic size, full length) of Col. Archibald Gracie, 4th, hero of the *Titanic* disaster, 1914, by Louise Kidder Sparrow. Gift of Mrs. Archibald Gracie, 4th.

Portrait of Commodore Stephen Decatur by Gilbert Stuart; bequeathed to the Smithsonian Institution for the National Gallery of Art by the late Stephen Decatur Parsons. (Accepted by the commission December 9, 1930.)

Portrait of Henry Ward Ranger by Albert Niehuys (Dutch artist); presented by Frederick Ballard Williams, N. A.

Original plaster bust of Abraham Lincoln (heroic size) from which was cast the bronze bust erected at the National Cemetery, Gettysburg, Pa., by Henry K. Bush-Brown; gift of the sculptor. This bust has been in the gallery for several years as a loan.

A group of three wood-gravure tablets engraved directly from life and nature by Macowin Tuttle: Portrait of a Lady, Snowbound (winter landscape), and Spring Brook (spring landscape). Gift of Mr. Tuttle.

Painting entitled "Late Afternoon, the Alcazar, at Segovia, one of the picturesque medieval castles of Spain," by Wells M. Sawyer. Gift of the artist.

Marble bust of William H. Seward, made in Rome in 1871 by Giovannie Maria Benzoni (1809–1873), "as a gift in memory of his daughter, Olive Risley Seward"; also the framed oil painting by Emanuel Leutze (1816–1868), sketch from which he made the fresco in the Capitol Building at Washington, D. C., known as "Westward the Course of Empire Takes its Way," and presented to William H. Seward by the artist. Bequest of Miss Sara Carr Upton.

Portrait of William Henry Holmes, first director of the National Gallery of Art, by William Spencer Bagdatopoulos in 1929; presented by the artist.

LOANS ACCEPTED BY THE GALLERY

Painting by Bonifaccio entitled "Supper at Emmaus"; lent by Benjamin Warder Thoron, of Washington, D. C., through Mrs. Henry Leonard.

Portrait of Henry Ward Ranger, N. A., by Alphonse Jongers, N. A.; lent by the Council of the National Academy of Design, New York, N. Y.

Fifteen paintings by British and Dutch masters; lent by Cleveland Perkins, Esq., Miss Ruth Perkins, and Mrs. Miriam Perkins Carroll, executors of the estate of the late Henry Cleveland Perkins, as follows:

Portrait of a Boy, by John Hoppner, R. A.
Henry, First Earl of Mulgrave, by Sir Thomas Lawrence, P. R. A.
Portrait of a Dutch Lady, by Michael Janson Mierevelt.
Portrait of a Dutch Girl, by P. Moreelse.
Portrait of a Girl, by John Opie, R. A.
Frances, Countess of Clermont, by Sir Joshua Reynolds.
The Windmill, by Salomon Ruysdael.
Study of Ruins, by Richard Wilson.
Study of Ruins, by Richard Wilson.
Landscape, by Richard Wilson.
Landscape with Cottage, by Meindert Hobbema.
Madonna and Child, by Van Dyck (attributed to).
Portrait of a Dutch Girl, by Jan Victoors.
A Gentleman, by Sir William Beechey, R. A.
A Cottage Scene, by Ladbrooke.

Five paintings by old masters; lent by Mrs. Marshall Langhorne, Washington, D. C., as follows:

Holy Family, by M. Albertinelli.
Head of Christ, by Giorgioni (attributed to).
The Doctor's Visit, by Jan Steen.
Baptism of Christ, by G. B. Tiepolo.
Small landscape, by Thomas Gainsborough.

Portrait of George Washington, by Charles Willson Peale; lent by William Patten, of Rhinebeck, N. Y., to be cared for until used by the George Washington Bicentennial Commission.

A Sevres porcelain statuette, by Paul Dubois, entitled "Le Courage Militaire"; lent by the Hon. Hoffman Philip, United States minister to Norway.

A painting, Madonna and Child, by Andrea del Sarto; lent by Mrs. W. W. Powell, Washington, D. C.

A pastel, A Madonna and Child, conception of F. D. McCreary, executed by Pastelist Bryson, of Chicago, Ill.; lent by Mrs. B. S. Williams, of Knoxville, Tenn.

Usual loans of paintings for the summer months are:

Portrait of George Washington, by Rembrandt Peale; lent by the Hon. Charles S. Hamlin, Washington, D. C.

Portrait of Nathaniel Tracy, of Newburyport, Mass., by John Trumbull; portrait of Thomas Amory, of Boston, and portrait of George A. Otis, both by Gilbert Stuart; lent by Mrs. O. H. Ernst and Miss Helen Amory Ernst, of Washington, D. C.

Portrait of Mrs. Charles Eames, by Gambardella; lent by Mrs. Alastair Gordon-Cumming, of Washington, D. C.

DISTRIBUTIONS

A painting, The Battle of Celere, by J. C. Bourgignon; withdrawn by the owner, Mrs. J. M. Wiley, for shipment to Holland.

The large painting by Theobold Chartran, of Paris, representing the Signing of the Peace Protocol between Spain and the United States, August 12, 1898, lent to the gallery in 1928, has been recalled to the White House by Mrs. Hoover.

The painting by Peter Moran, entitled "A Rainy Day," withdrawn by the owners, Miss Florence Grandin and her sister, of Washington, D. C.

Two small paintings by John J. Peoli, entitled "Love Conquers" and "Cupid Caged," were returned to Mrs. Laura Guiteras, Denver, Colo., residuary legatee of the estate of Mrs. Mary Peoli Maginn.

A painting, Salome with the Head of John the Baptist, attributed to Guido Reni, was withdrawn by J. H. Weaver, of Washington, D. C., to whose ownership it had been transferred by Hobart Berriman.

A painting, The Infant Jesus and St. John, by Rubens, lent to the gallery by Hon. Hoffman Philip in 1919, withdrawn by Mr. Philip.

A painting, Minerva (sixteenth century original), was withdrawn by Miss May Warner.

LOANS RETURNED TO THE GALLERY

Mrs. Herbert Hoover returned to its place in the gallery the painting by Alexander Wyant, entitled "The Flume, Opalescent River, Adirondacks," which was lent for temporary display at the White House early in 1929.

THE HENRY WARD RANGER FUND PURCHASES

The paintings purchased during the year by the Council of the National Academy of Design from the fund provided by the Henry Ward Ranger bequest, which under certain conditions are prospective additions to the National Gallery collections, are as follows, including the names of the institutions to which they have been assigned:

Title	Artist	Date of purchase	Assignment
81. The Countryside in Autumn.	Charles H. Davis, N. A.	December, 1930	Connecticut Agricultural College, Storrs, Conn.
82. The Sermon	Gari Melchers, N. A.	January, 1931	The Corcoran Gallery of Art, Washington, D. C.
83. The Offering	Charles Webster Hawthorne, N. A. (1872–1930).	February, 1931	The Cleveland Museum of Art, Cleveland, Ohio.
84. The Madonna	Ivan G. Olinsky, N. A.	March–April, 1931	Everhart Museum of Natural History, Science, and Art, Scranton, Pa.

The gallery has received two portraits of Henry Ward Ranger (already mentioned): One, by Alphonse Jongers, N. A., as a loan from the National Academy of Design; the other, by Albert Niehuys, as a gift from Frederick Ballard Williams, N. A., assistant treasurer of the academy.

The will of Henry W. Ranger provides that the National Gallery of Art shall have the right to reclaim any picture for its collection during the 5-year period beginning 10 years after the artist's death and ending 15 years after his death, and it may be interesting to list the deceased artists to June 30, 1931.

Artist	Date of death
1. Carlton T. Chapman, N. A	Feb. 12, 1925.
2. Dwight W. Tryon, N. A	July 1, 1925.
3. William A. Coffin, N. A	Oct. 26, 1925.
4. Ben Foster, N. A	Jan. 28, 1926.
5. Thomas Moran, N. A	Aug. 26, 1926.
6. H. Bolton Jones, N. A	Sept. 24, 1927.
7. Robert Reid, N. A	Dec. 2, 1929.
8. Gardner Symons, N. A	Jan. 12, 1930.
9. Charles W. Harthorne, N. A	Nov. 29, 1930.

LIBRARY

The gallery library continued to increase by gift, purchase, and subscription, in volumes, pamphlets, periodicals, etc. Fifty-one volumes of periodicals were collated and bound.

Notable accessions to the library are as follows:

A tinted pencil-drawing in miniature of Dr. William H. Holmes by Alyn Williams, P. R. M. S., R. C. A., presented by the artist.

Eleven bound volumes of biographical memoirs called Random Records, left-over remnants from 52 years of research and art work in many fields; gift of W. H. Holmes.

Twelve large framed water-color paintings by W. H. Holmes; gift of the artist:

1. Deserted Bed of a Glacier.
2. The Unmodified Rock Creek about 1910.
3. The Normal Rock Creek About 1910.
4. Over the Maryland Fields.
5. My Old Mill, Holmescroft, near Rockville.
6. A Storm-Beaten Course.
7. A Maryland Wheat Field.
8. A Maryland Meadow, Watt's Branch, near Rockville.
9. A Gypsy Camp.
10. A Cliff Dwellers' Ceremony, Colorado.
11. A Mountain Gorge, Colorado.
12. Coal Barge, Capri, 1880.

Fourteen water-color paintings of diversified subjects by W. H. Holmes; gift of the artist. (These include the 12 noted in the 1927 annual report.)

A Pompeiian Fountain, 1880.
On the Ocean, off Nova Scotia, 1880.
A Color Study, Venetian Freight Boats.
Longs Peak, Colorado, 1874.
A Great Geological Arch, Colorado, 1874.
The Land of the Cliff Dwellers, 1874.
In the Pueblo Country, New Mexico, 1876.
A Mexican Laundry, 1895.
Playing with the Colors.
Shaded Pathways.
View on the Potomac.
The Fields of Maryland.
Study of a Bridge.
Still Life—Apple and Bottle.

Ten field sketches, of small size, by Thomas Moran; pen sketch by Mrs. W. H. Holmes; and a sketch in Florida (in colors) by Walter Paris; gift of W. H. Holmes.

Twenty-nine small, unframed paintings in different mediums by 20 artists; gift of W. H. Holmes.

1. A Neopolitan Lady, by C. Bisco.
2. Marine Study, by Franklin D. Briscoe.
3. Burial of a Pappoose, probably Siouan, by Richard N. Brooke.
4. Drawing of a Yellowstone Geyser, by Richard N. Brooke.
5. Landscape Sketch, by J. F. Currier.
6. Burning of an Old Boat, by F. Denby, A. R. A.
7. A Group of Elk, Wind River Mountains, Wyoming, by E. W. Deming.
8. French Village Scene, by H. A. Dyer.
9. Landscape, by De Lancey Gill.
10. Landscape Sketch, by De Lancey Gill.
11. Naples and Vesuvius, by A. Gurri.
12. Sketch on the Potomac, by Lorenzo J. Hatch.
13. In the Plateau Country—Colorado, by W. H. Holmes.
14. Marine View, by "Marnz."
15. Landscape with Palm Trees and Temple, Egypt, by Charles M. McIlhemey.
16. Shin-Au-Av-Tu-Weap—God Land Canyon of the Colorado, Utah, by Thomas Moran.
17. In Monument Park, Colorado, by Walter Paris.
18. Landscape, by Walter Paris.
19. Study of a Courtier, by Randonini.
20. Landscape Sketch, by Walter Shirlaw.
21. Figure Study, by Walter Shirlaw.
22. A Study of an Italian Peasant Woman, by Guisep Signorini.
23. Study of an Old Man, by Guisep Signorini.
24. Sketch in Wales, by Peter Toft.
25. Group of Venetian Sailboats, by Ross Turner.
26. Charcoal Boat on the Mediterranean, by Ross Turner.
27. Venetian Boats, by Ross Turner, 1880.
28. A Street Scene in Munich, by Ross Turner, 1880.
29. A Tree Study, by Ross Turner, 1879.

NECROLOGY

The death of James Parmelee at his home in Washington, D. C., on April 19, 1931, is announced. Mr. Parmelee was a member of the National Gallery of Art Commission, one of the commission's executive committee, and chairman of the committee on prints.

A biographical notice of Mr. Parmelee may be found in the Cathedral Age, midsummer issue, 1931, page 28.

PUBLICATIONS

Holmes, W. H. Report on the National Gallery of Art for the year ending June 30, 1930. Appendix 2, report of the Secretary of the Smithsonian Institution for the year ending June 30, 1930, pp. 45–53.

Lodge, J. E. Report on the Freer Gallery of Art for the year ending June 30, 1930. Appendix 3, report of the Secretary of the Smithsonian Institution for the year ending June 30, 1930, pp. 54–60.

Catalogue of a collection of water-color paintings by W. S. Bagdatopoulos, on view in the National Gallery of Art, United States National Museum, October 30 to December 22, 1930. Pp. 1–8.

Catalogue of a memorial exhibition of water colors of Egypt, Greece, France, Italy, and England, by Henry Bacon (1839–1912), on view in the National Gallery of Art, United States National Museum Building, March 14 to April 30, 1931. Pp. 1–9, 4 pls.

Fortieth annual exhibition of the Society of Washington Artists, being a list of the titles and authors of the works shown, with an introduction by Dr. William H. Holmes, Director of the National Gallery of Art. Privately printed for the society, 1931. Pp. 1–30, 20 pls.

Respectfully submitted.

W. H. Holmes, *Director.*

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

APPENDIX 3

REPORT ON THE FREER GALLERY OF ART

SIR: I have the honor to submit the eleventh annual report on the Freer Gallery of Art for the year ending June 30, 1931:

THE COLLECTIONS

Additions to the collections by purchase are as follows:

BRONZE

31.10. Chinese, fifth century B. C. Chou dynasty. Ceremonial vessel of the class *i*, with four handles. Green patina.

JADE

31.15–31.16 Chinese, Han dynasty (206 B. C.–A. D. 220). Two ornaments of white, semitranslucent jade, surface color altered to a brownish cream. Decoration carved and engraved.

MANUSCRIPTS

30.86. Nepalese, twelfth century. The *Prajñāpāramitā*. Palm leaves (69) within wooden covers. (See also below under *Paintings*, 30.87, 30.88.)

30.92–30.95 Persian, thirteenth century. Four leaves from a *Qurān* (miniature size). Text in brown *naskhī* script.

31.9. Arabic (North Africa), twelfth century. A bound volume of a section of the *Qur'ān*. Vellum. Text in brown and blue *Maghribī* script; page and text ornaments in gold and slight color.

31.11. Persian, sixteenth century. A page from the *Gulistān* of Sa'adī, written in a delicate *naskhī* script on light blue paper; five ornaments in gold and color.

PAINTING

30.80. Chinese, fifteenth century. Ming. By Tai Chin. A landscape entitled "Life on the river." Silk scroll, painted in ink and tint.

30.81. Indian, late sixteenth century. Rajput, Rājasthānī. A musical mode (*rāg*): a night scene. Color on paper.

30.82. Indian, early nineteenth century. Rajput, Pahāṛī (Kāngṛā). Portrait of a lady. Color and gold on paper.

30.83. Indian, early nineteenth century. Rajput, Pahārī (Kāngrā). Śrī Krishna fluting in the forest. Color and gold on paper.

30.84. Indian, early nineteenth century. Rajput, Pahāṛī, (Kāngṛā). Maidens searching for Krishna in moonlight. Color and gold on paper.

30.85. Indian, eighteenth–nineteenth century. Rajput, Pahārī (Kāngṛā). Scene from a Nala-Damayantī series: The toilet of Damayantī. Outline drawing and light tints on a primed paper.

30.87–30.88. Nepalese, twelfth century. Two pages, each containing three miniatures from the *Prajñāpāramitā* (MS. 30.86; see above). Opaque colors on palm-leaves.

30.89–30.91. Persian, fourteenth century. Mongol period. Three pages from a *Shāhnāmah*. Color, black and gold on a gold ground. Text in black *naskhī* script.

31.1. Chinese, fourteenth century. Yüan dynasty. By Tsou Fu-lei. Plum branches in flower, entitled, "A breath of spring." A scroll painting; ink on paper. Signed.

31.2. Chinese, thirteenth century. Late Sung. By Wang Yen-sou. Branches of a plum tree in flower, entitled, "Plum blossoms." Scroll painting; ink on silk. Signed.

31.3. Chinese, thirteenth century. Late Sung. Landscape; horses and grooms crossing a river. Scroll painting; color and ink on paper.

31.4. Chinese, fourteenth century. Yüan. Attributed to Chao Mêng-fu. A goat and a sheep. Scroll painting; ink on paper. Signed.

31.5–31.6. Indian, early seventeenth century. Mughal. School of Akbar. Two illustrations from *Rasikapriyā* MS. Color and gold on paper.

31.12. Persian, late sixteenth century. Portrait of a lady. Ink, slight tint and gold, on paper.

31.13. Persian, middle sixteenth century. Portrait of a man. Full color and gold on paper.

31.14. Persian, middle sixteenth century. Portrait of a youth, reading. Full color and gold on paper.

POTTERY

31.7. West Asian, eleventh–twelfth century. Rakka. A star-shaped lamp, with six spouts and six feet. Light blue-green glaze, worn and crazed.

SILVER

31.8. Chinese eighth century. T'ang dynasty. Bowl, decorated with a band of foliate design in low relief. Surface covered by a delicate ornament executed in fire gilt.

Curatorial work within the collection has embraced specifically the study and recording of inscriptions and seals on recently acquired Chinese paintings and of Buddhist inscriptions on stone sculptures and votive bronze images. The work of cataloguing the near eastern section of manuscripts and paintings, mentioned as being under way in the last report, has been completed. Translation of the Persian texts has fixed the identity of upwards of 60 Persian miniatures taken from various early manuscripts of the *Shāhnāmah*, the *Gulistān* of Sa'adī, and other works. In addition to translations of inscriptions on objects in the Freer collection others have been made of inscriptions on objects submitted to the curator by other institutions and by private persons for expert opinion as to their esthetic or historical value. In all, 2,312 objects and 107 photographs of objects were submitted for examination.

The most important changes in exhibition that have been made since 1923 were accomplished during the week of March 15, amounting to the opening of four new galleries and changed exhibitions in two others. Galleries I and II, at the right of the entrance, are now devoted to the display of works of art from the Near East and India. Included in these are early Arabic manuscripts and paintings, Arabic tooled leather bindings, Persian manuscripts, paintings and painted pottery, Indian painting and sculpture. This change has not only given increased space to the near eastern section but also has left the eastern end of the building to the exclusive exhibition of the arts of China. Ancient bronzes, silver, and silver-gilt are now displayed in Gallery XIV, ceremonial and ornamental jades of the Chou and Han periods in the adjoining corridor. Gallery XVIII exhibits scroll paintings and Gallery XIX pottery, porcelain, and panel paintings.

The care and preservation of objects in the collection has included work that can be itemized as follows:

(1) Remounted:
- 2. Chinese scroll paintings.
- 1 Chinese panel painting.
- 2 Japanese screen paintings.
- 6 Indian miniature paintings.

(2) Repaired (i. e., relined, remounted, or resurfaced):
- 22 paintings by Whistler.
- 2 paintings by A. H. Thayer.
- 2 paintings by T. W. Dewing.
- 2 paintings by D. W. Tryon.
- 2 paintings by G. Melchers.
- 1 painting by J. S. Sargent.
- 1 painting by A. Ryder.

Changes in exhibition have involved a total of 482 objects, as follows:

9 American paintings.
50 Chinese bronzes.
13 pieces of Chinese silver-gilt.
135 Chinese jades.
19 Chinese scroll paintings.
15 Chinese panel paintings.
10 pieces of Chinese porcelain.
59 pieces of Chinese pottery.
2 Japanese screen paintings.
4 Japanese panel paintings.
48 pieces of near eastern pottery.
1 Turkish pottery tile.
12 Arabic and Egyptian bookbindings.
2 Indian stone sculptures.
101 Indian and Persian paintings and calligraphies.
2 pieces of Persian glass.

THE LIBRARY

During the year there have been added to the main library 61 volumes, 20 unbound periodicals, and 150 pamphlets. Twenty volumes were sent to the bindery, 10 volumes to be bound, 4 volumes to be repaired, 48 numbers of *Kokka* to be bound in 4 volumes, and 6 numbers of *T'oung Pao* to be bound in 2 volumes. A list of the new accessions to the library accompanies this report as Appendix A (not printed).

The library is in process of being catalogued under the direction of the librarian of the Smithsonian Institution, W. L. Corbin. This work was begun in November, 1929, and is not yet completed.

REPRODUCTIONS AND PAMPHLETS

Seven hundred and sixty-four new negatives of objects have been made. Of these, 329 were made for registration photographs, 435 for special orders and 67 for study purposes. The total number of reproductions available either as carbon photographs or as negatives from which prints can be made upon request is now 3,858. Twenty-four additional post cards have been published, making a total number of 96 subjects now on sale. One hundred and nineteen lantern slides have also been added to the collection, making a total of 1,030 available for study and for sale.

The total number of sales of reproductions, at cost price, is as follows: Photographs, 1821; post cards, 15,489; lantern slides, 12.

Of booklets issued by the gallery, the following were sold at cost price:

F. G. A. pamphlets	117
Synopsis of History pamphlets	105
List of American paintings	37
Annotated outlines of study	17
Gallery books	204
Floor plans	18

BUILDING

The workshop has been constantly occupied with the making of necessary equipment, as well as with the work necessary to the upkeep of the building. Under the latter the most important item was the renewal of the attic shade system with new and better operating parts and a complete set of new curtains. A new device for holding the smaller paintings to be photographed, four new exhibition cases, two bookcases, and additional frames for the card display are among the items of new equipment. The report of the superintendent, which gives a detailed account of shopwork and of the planting in the court, accompanies this report as Appendix C (not printed).

ATTENDANCE

The gallery has been open every day from 9 until 4.30 o'clock with the exceptions of Mondays, Christmas Day, and New Year's Day.

The total attendance for the year was 125,789; the total attendance for week days was 82,574; the total Sunday attendance 43,215. As before, the average Sunday attendance is much more than twice that of week days, 831 being the average for Sunday and 318 that for a week day. Attendance reached its height in April and August with totals of 23,401 and 41,950, respectively.

The total number of visitors to the offices was 1,510. Of these, 91 came for general information, 295 to call upon members of the staff, 119 to see objects in storage, 100 to submit objects for examination, 74 to study the building and installation methods, 11 to visit the galleries on Mondays, 216 to study in the library, 203 to see the reproductions of the Washington Manuscripts, 19 to make photographs and sketches, and 16 to make tracings, while 229 came to purchase photographs, and 137 to examine photographs of objects in the collection.

Fifty-two groups, ranging from 2 to 47 persons, were given docent service in the exhibition galleries, and 10 classes in groups ranging from three to nine persons were given instruction in the study room.

On Thursday, March 12, 1931, Dr. Rudolf Meyer Riefstahl gave an illustrated lecture on Islamic Painting before an audience of 163 persons.

FIELD WORK

A general survey of the gallery's activities in the Far East will be found in Mr. Bishop's confidential letters, copies of which are transmitted herewith (Appendix B not printed).

As in past years, we have steadfastly adhered to our fundamental practice of conducting our expedition with due respect both for the dignity of the Institution and for the sensibilities of the Chinese, since it is our purpose, as long as we stay in the field, to serve our own immediate ends only to the extent that in so doing we serve also the ends of future archeological research in China and help to establish an atmosphere of greater mutual regard and confidence between native and foreign scientists. The fact that under existing conditions, difficult at times to the point of discouragement, we should have been able to carry out important excavations in southwestern Shansi during the autumn and spring seasons of last year, speaks well, I think for our policy, our field staff, and our Chinese collaborators. Mr. Bishop's detailed illustrated report on these excavations is expected shortly.

PERSONNEL

Archibald G. Wenley returned to the gallery January 5, 1931, after seven years spent abroad in sinological study. Three years were spent in China, two in Europe, and two in Japan.

Miss Grace L. McKenney resigned May 15 because of ill health and returned to her home in Massachusetts.

Mrs. Rita W. Edwards returned May 16, after an absence of 11 months, and resumed her position as secretary to the curator.

Miss Eleanor Thompson, who filled this position during Mrs. Edwards's absence, has transferred to the position vacated by Miss McKenney, in charge of the print section.

William Acker, student assistant, left June 18, 1931, for Holland to resume his sinological studies at the University of Leyden.

Miss Grace Aasen, library assistant, was married on June 20, 1931, to Marvin Lamar Parler.

Herbert E. Thompson worked at the gallery during the weeks of October 26, 1930, February 22, and March 29, 1931.

Y. Kinoshita worked at the gallery from January 24 to July 11, 1931.

Respectfully submitted.

J. E. Lodge, *Curator.*

Dr. C. G. Abbot,
Secretary of the Smithsonian Institution.

APPENDIX 4

REPORT ON THE BUREAU OF AMERICAN ETHNOLOGY

SIR: I have the honor to submit the following report on the field researches, office work, and other operations of the Bureau of American Ethnology during the fiscal year ended June 30, 1931, conducted in accordance with the act of Congress approved April 19, 1930. The act referred to contains the following item:

American ethnology: For continuing ethnological researches among the American Indians and the natives of Hawaii, the excavation and preservation of archeologic remains under the direction of the Smithsonian Institution, including necessary employees, the preparation of manuscripts, drawings, and illustrations, the purchase of books and periodicals, and traveling expenses, $70,280.

M. W. Stirling, chief, left Washington during the latter part of January to continue his archeological researches in Florida. On the way south he took the opportunity to investigate a number of archeological sites in several of the Southern States, notably a group of mounds which had been reported in the vicinity of High Point, N. C., and two mound sites on Pine Island in the Tennessee River in northern Alabama.

A few days were spent in the vicinity of Montgomery, Ala., examining the early historic sites being investigated there by the Alabama Anthropological Society. A large mound had been reported in the vicinity of Flomaton, Ala.; this was visited and found to be a natural formation.

Continuing down the west coast of Florida, Mr. Stirling visited briefly the archeological sites at Crystal River, Safety Harbor, and Alligator Creek. The principal work for the season was commenced on February 5 on Blue Hill Island south of Key Marco, one of the northernmost of the Ten Thousand Island Group. A large sand burial mound was excavated and found to be of early post-Columbian Calusa origin. Excavation of the mound disclosed a number of interesting structural features quite unusual in Florida sand mounds. Six feet above the base of the mound a clay floor was encountered which gave evidence of having been the base of a temple structure, as it was surrounded by post holes and in some instances by the decayed remains of the wooden uprights still in place. This structure had evidently been destroyed and the mound subsequently enlarged by adding 6 feet more of sand above the original substructure. Numerous burials were encountered both above and below the

clay floor. A few articles of European manufacture were recovered from the upper level of the mound. As none were recovered from beneath the temple floor, it is possible that the older section of the mound is of pre-Columbian age. Cultural material recovered was interesting though not abundant. This included characteristic pottery specimens, pendants and ornaments made from fossil shark teeth, shell dishes, cups, celts, and a few stone knives and arrowheads. Articles of European manufacture consisted of glass beads and iron axes of Spanish type. More than 250 burials were removed.

Following the completion of this work, Mr. Stirling went to the island of Haiti where, in the company of H. W. Krieger, of the United States National Museum, he investigated archeological sites previously worked by Mr. Krieger in various parts of the island. Returning from Haiti to Florida, work was continued in the eastern part of the State, where a number of mounds were investigated between Miami and Cape Canaveral.

The most interesting discovery of the entire season consisted in locating two series of large geometric earthworks on the eastern side of the Everglades, not far from Indiantown. One of these groups is one of the largest and best preserved works of this type now existing on the North American continent. It is hoped that at an early date the bureau will be able to begin excavations on this most interesting site. At the completion of this reconnaissance, Mr. Stirling returned to Washington, leaving almost immediately for Chicago in order to attend a meeting of the National Research Council, the purpose of which was to organize research on the subject of early man in America.

Dr. John R. Swanton, ethnologist, was engaged in field work in Louisiana from July 1 to August 14, 1930. It was found that Rosa Pierrette, the sole Indian acquainted with the Ofo language and the one from whom, in 1908, he obtained the only specimens of that language in existence, was dead, and the language therefore is dead also. A search was made for speakers of Atakapa, but all appeared to be gone except one old woman who could barely recall a few words. The Chitimacha Indians of Charenton were visited and a small amount of linguistic material was obtained from them. Of the Tunica at Marksville, only two or three are still able to use the old tongue, but one of these proved to be an ideal informant and Doctor Swanton obtained from him a number of short stories and one long story in native text. The rest of the time was spent at Kinder, where a considerable body of material in Koasati was obtained.

In view of the extinction of Atakapa as a spoken language, Doctor Swanton considered that the words, phrases, and texts collected by Dr. A. S. Gatschet in 1886, which comprise by far the greater portion

of the material in that tongue still preserved, should be published without delay and the greater part of the winter of 1930–31 was spent in editing it. To Gatschet's material have been added the Eastern Atakapa words collected by Murray and the Akokisa vocabulary obtained by the French captain, Bérenger, and published by Du Terrage and Rivet. A bulletin containing all this is now in the hands of the printer.

Work has progressed on the tribal map of North America which is being copied by Mrs. E. C. M. Payne, and additions have been made to the text to accompany it.

Doctor Swanton is preparing the first draft of a Handbook of the Indians of the Southeast.

The closing weeks of the year were devoted to reading the proof of Bulletin 103, entitled "Source Material for the Social and Ceremonial Life of the Choctaw Indians."

Dr. Truman Michelson, ethnologist, was at work among the Kickapoo of Oklahoma at the beginning of the fiscal year. A really representative body of Kickapoo mythology is now available, and it is quite certain that it is more northern than Fox mythology. The ritualistic origin myths are still terra incognita. A good beginning has been made on Kickapoo social organization. In the middle of July Doctor Michelson went among the Foxes of Iowa. The object of the trip was to restore one Fox test phonetically and to obtain some new texts, in the current syllabic script, on Fox ceremonials, in both of which projects he was successful. Doctor Michelson returned to Washington August 4. He completed his memoir on the Fox Wâpanōwiweni and transmitted it for publication February 7. His paper, Contributions to Fox Ethnology, II, Bulletin 95 of the bureau, appeared in the course of the fiscal year.

The remainder of the time was largely taken up studying materials gathered previously and also in extracting from Petter's Cheyenne Dictionary such stems and words as can be rigorously proved to be Algonquian. The material on the physical anthropology of the Cheyenne showed clearly the great variation that occurs among living races. A proper technique was worked out for determining the Cheyenne words of Algonquian origin. Though Petter's alphabet is inadequate, it was possible to partially control this material by comparing it with that of Doctor Michelson. Approximately 700 of such words and stems were extracted. Though the technique mentioned above is very slow, Doctor Michelson is convinced that it is the correct procedure. It was entirely feasible to establish about 70 phonetic shifts which have transformed Cheyenne from normal Algonquian into divergent Algonquian.

Toward the close of May Doctor Michelson left for Oklahoma and renewed his work with the Cheyenne of that State. He restored phonetically the material extracted from Petter, with the result that it is now possible to formulate the transforming phonetic shifts with greater nicety. He also measured a number of Cheyenne. Though the number is not yet large enough to be absolutely decisive in a statistical sense, there is good reason to believe that the vault of their skulls is low, thus resembling the Dakota Sioux rather than most Algonquian tribes. Some new data on Cheyenne social life and mythology were obtained. It was his privilege to consult with some other anthropologists in Oklahoma and to visit one museum.

John P. Harrington, ethnologist, was engaged during the summer of 1930 in the preparation of his report on the Indians who were brought together at San Juan Bautista Mission in the first half of the nineteenth century by the Spanish-speaking padres from various parts of San Benito County, Calif., and the adjacent region. A valuable vocabulary of the language, recorded by Father Felipe Arroyo de la Cuesta, had already been published by the Smithsonian Institution in the sixties of the last century, but aside from this vocabulary there was little or nothing in print on these Indians. Elaborating a wealth of material obtained from Mrs. Ascención Solórsano, the last San Juan Indian who spoke the language, who died in January, 1930, Mr. Harrington prepared a report on all phases of the life of these Indians, as far as reconstructable. This report tells of the remarkable way in which the language and partial ethnography were rescued from this sole survivor, and then proceeds to the history, geography, and customs of the tribe, including all that could be learned of former religion, ceremony, and mythology.

Mrs. Solórsano was an Indian herb doctor, and a feature of the work during the summer of 1929 had been to obtain specimens and information to cover the ethnobotany of the tribe. Further specimens were obtained in the summer of 1930 by Mrs. Dionisia Mondragón and Miss Marta J. Herrera, daughter and granddaughter of Mrs. Solórsano, and these were all identified by C. V. Morton, of the National Herbarium. This section gives the treatment for curing some 60 different ailments with these herbs and by other curious means. It forms a nucleus for making comparative studies in Indian medicine.

At the end of January, 1931, Mr. Harrington left for California for the purpose of continuing his studies in this region, this time specializing on the Esselen and Antoniano Indians in the southern part of Monterey County. Taking the specimens of San Juan Bautista plants with him and arriving in wild-flower season, a thor-

ough collecting of plants was rewarded with a great mass of information which further elucidated much of the San Juan plant material. This collecting was done in several places in southern Monterey County and simultaneously in San Benito County. Seeds used for food were actually made up into the food product to get the primitive process, and the same method was followed in the study of medicines.

Along with the plants the field of ethnozoology was thoroughly covered and practically all the animals known to these Indians were identified. Specimens were obtained, especially of birds, which proved to be the most difficult field for identification in the collecting of animal names, and the skins were identified by the division of birds of the National Museum. Eight different kinds of snakes were known by name and identified.

One of the rarest features of the work was the obtaining of a number of old Indian place names in the old Esselen country, the western tributary of the Salinas River known as the Arroyo Seco. A study of the place names resulted in the discovery that the Esselen were not a coastal but an inland people, inhabiting the Arroyo Seco and a section of the Salinas River and centered about Soledad Mission. They were one of the smallest tribes in California, and the name properly begins with an h; they were known in the San Juan Bautista from all that section of California. The expedition went from Monterey to the Aguage de Martin and from there climbed the mountain. Some 40 exposures were made of the various rocks connected with the ceremonies and the springs and camps, and several hundred pages of notes were taken down in California Spanish from Don Angel and others dealing with the history of these ceremonies and the life of Mariana and Joaquin Murrieta. On the way back to the coast the Cruz Cervantes ranch was visited, where Murrietta and Mariana were equipped by Don Cruz for starting their war against the Americans.

An examination of place names and village sites and linguistic studies occupied Mr. Harrington up to the end of June. Not only were vocabularies of early recording utilized but the invaluable records contained in the old mission books were, through the courtesy of Bishop McGinley, of Fresno, placed at the disposal of the Smithsonian Institution for copying, and a considerable part of these books has already been copied and revised with the aid of the oldest Indians.

Dr. F. H. H. Roberts, jr., archeologist, devoted the fiscal year to a number of activities. During the months of July, August, and September, excavations at a site on the Zuñi reservation, 16 miles northeast of the Indian village of Zuñi, were brought to a conclusion.

The work had been started the latter part of May, 1930. At the end of the season's field work the ruins of two houses, one containing 64 rooms, the other 20 rooms, and a number of ceremonial chambers had been cleared of the débris which had accumulated in them in the centuries which have passed since their abandonment.

Evidence showed that the largest of the houses had not been erected as a complete unit and that it was not occupied in its entirety at any time. The central block, together with a superceremonial chamber placed at its southern side, constituted the original block of the structure. Subsequent additions consisted of an east-and-west wing and a series of chambers south of the original portion and east of the great ceremonial chamber. Masonry in the walls of the latter portions was inferior to that in the original section. The outlines of the rooms in these same portions of the building were so irregular that they appeared to have been built by a different group of people. The walls in the original section were constructed in a style characteristic of the ruins in the Chaco Canyon, 85 miles northeast from the Zuñi region. The stonework in the latter portions of the building was suggestive of the type found in the ruins of the Upper Gila area to the south.

The small house did not give evidence of growth stages as distinct as those observed in the large building; it did show, however, that a fairly small structure had been added to on various occasions. The walls in this building were of the same nature as those in the later portions of the larger dwelling, except that the stones were more carefully dressed. This suggested that the small house may have been built by the same group which erected the later portions of the large one.

In addition to the two houses and seven small ceremonial chambers two great kivas were found. Only one of these was excavated. In the case of the other it was possible merely to trace the outer walls in order to obtain the size and position of the structure. The finding of these two great kivas was significant because investigations in the Southwest have shown that such structures are always associated with some form of the Chaco culture. The great kiva connected with the larger of the two dwellings revealed one of the essential characteristics of such structures when the débris which filled it was removed. It had an average diameter of 55 feet. The second of these large circular houses was completely detached from the other buildings in the village and had been placed in a court formed by the other structures. It averaged 78 feet in diameter, which makes it the largest yet discovered.

The excavations yielded 400 specimens of the people's handicraft in addition to the information on house types. Included in the

collection are pottery vessels, tools or implements of stone and bone, ornaments, and a number of stone images. The pottery is characterized by examples typical of the Chaco Canyon wares and also specimens characteristic of the Upper Gila region to the south. The summer's investigations demonstrate that the village on the Zuñi Reservation belongs to the great period of the prehistoric pueblos, that designated as Pueblo III in southwestern chronology. The evidence obtained also indicates that there was a fusion of two groups of people at this location: One, the first to arrive, came from the Chaco area in the north, and the other from the Upper Gila villages in the south. Charred timbers obtained from the ruins enabled Dr. A. E. Douglass, of the University of Arizona, to give the dates 1000 to 1030 A. D. for the life of the community.

Upon the completion of the above work one week was spent in making an archeological survey on the Zuñi reservation and in the region west and northwest from that district. As a result of the reconnaissance, a promising site for further investigations was found. Following this, a trip was made to Cortez, Colo., for the purpose of inspecting ruins being excavated by Lee Dawson near the opening into McElmo Canyon, 4 miles southwest from Cortez. It was found that Mr. Dawson had an unusually interesting group of unit-type houses on his property. Of particular interest were the kivas or ceremonial chambers associated with these structures. In many of them the walls had been ornamented with a series of paintings placed in bands encircling the walls. From Cortez the writer went to Denver and from there returned to Washington the middle of October.

During the winter months, galley, page, and final proofs were read on Bulletin 100, a report on work conducted during the summer of 1929, entitled "The Ruins of Kiatuthlanna, Eastern Arizona." In addition, the specimens brought in from the summer field work were studied. Drawings and photographs were made of them for use in a report on the work. Six hundred pages of manuscript, entitled "The Village of the Great Kivas on the Zuñi Reservation, New Mexico," was prepared. Thirty text figures were drawn to accompany this manuscript.

Doctor Roberts left Washington May 14, 1931, for Denver, Colo., for the purpose of inspecting and studying the specimens obtained by the Smithsonian Institution-University of Denver Cooperative Expedition in the summer of 1930 and also for the purpose of examining collections in the Colorado State Museum. He left Denver on May 25 for Santa Fe, N. Mex. At the latter place two days were spent in studying the collections at the Laboratory of Anthropology and at the Museum of New Mexico. From Santa Fe he proceeded

to Gallup, N. Mex., where supplies were obtained for a field camp. From Gallup this material was taken to a site 3½ miles south of Allantown, Ariz., where a camp was established and excavations started on the remains of a large pit-house village. One refuse mound containing 12 burials with accompanying mortuary offerings and two pit houses had been investigated at the close of the fiscal year.

The pit houses were found to be characteristic of that type and quite comparable to those excavated in the Chaco Canyon in 1927, reported in Bulletin 92 of the Bureau of American Ethnology, and to those excavated in eastern Arizona in the summer of 1929, described in Bulletin 100 of the bureau.

From July 1, 1930, to May 10, 1931, J. N. B. Hewitt, ethnologist, was engaged in routine office work, and from the latter date to the end of the fiscal year he was engaged in field service on the Grant of the Six Nations on the Grand River in Ontario, Canada, and, briefly, on the Tuscarora reservation in western New York State.

Mr. Hewitt devoted much time and study to rearranging and retyping some of his native Iroquoian texts which critical revisions and additional data had made necessary to facilitate interlinear translations and to render such texts as legible as possible for the printer.

The texts so treated are the Cayuga version of the founding of the League of the Iroquois as dictated by the late Chief Abram Charles; the version of the Eulogy of the Founders as dictated by Chief Jacob Hess in Cayuga, and also his versions of the addresses introducing the several chants; also, four of the myths of the Wind and Vegetable Gods which are usually represented by wooden faces and husk faces (which are customarily misnamed masks, although their chief purpose is to represent, not to mask). The Onondaga texts of these myths were in great need of careful revision, for their relator was extremely careless in his use of the persons and the tenses of the verbs, frequently changing from the third to the second person and from past to future time by unconsciously employing the language of the rites peculiar to the faces; and also the decipherment of a set of pictographs or mnemonic figures, designed and employed by the late Chief Abram Charles, of the Grand River Reservation in Canada, to recall to his mind the official names and their order of the 49 federal chiefs of the Council of the League of the Iroquois, in chanting the Eulogy of the Founders of the League; and also to recall the 15 sections or burdens of the great Requickening Address of the Council of Condolence and Installation; this paper with illustrations is nearly ready for the printer; and also a critical study of the matter of the Onondaga and the Cayuga texts, giving the several

variant versions of the events attending the birth and childhood and work of Deganawida. He was born of a virgin mother, which indicated that underlying them there appeared to be an ideal figure, although of course unexpressed. This discovery showed the need for thorough search in the field for a living tradition in which this ideal is fully expressed. Further search was deferred to field work. It was clear that such an ideal enhanced the beauty of the birth story of Deganawida and made more interesting the historicity of such a person. Mr. Hewitt had the great satisfaction of recovering such a tradition in his subsequent field researches. He found that the inferiority complex had precluded his present informants from expressing themselves during the lifetime of other informants, whose recent deaths opened their mouths without the fear of contradiction. The death of Abram Charles within the year made these shy informants vocal.

In January Matthew W. Stirling, chief of the Bureau of American Ethnology, requested Mr. Hewitt to undertake the editing of the Manuscript Journal of Rudolph Friederich Kurz, of Berne, Switzerland, in the manner in which he had prepared the Edwin Thompson Denig Report on the Indian Tribes of the Upper Missouri River, published in the Forty-sixth Annual Report of the Bureau of American Ethnology. The Kurz manuscript was written in German during the years 1846 to 1852. The typed German text consists of 454 pages of large legal cap size, while the English translation of it by Myrtis Jarrell occupies 780 pages. The journal is a narrative of Mr. Kurz's experiences in a trip up the Mississippi River from New Orleans to St. Louis, thence up the Missouri to Fort Union at the Mouth of the Yellowstone River, and of his difficulties with the Indians while endeavoring to make drawings or pictures of them. There are 125 pen sketches of Indians and others accompanying the manuscript.

Mr. Hewitt represents the Bureau of American Ethnology, Smithsonian Institution, on the United States Geographic Board, and is a member of its executive committee. In connection with the forthcoming issue of the sixth report of this board much extra work had to be done by members of the executive committee. Mr. Hewitt prepared a memorandum for a portion of the introduction. Mr. Hewitt also devoted much time and study to the collection and preparation of data for official replies to correspondents of the bureau, some demanding long research. Miss Mae W. Tucker has assisted Mr. Hewitt in the care of the manuscript and phonograph and photograph records of the archives.

On May 10, 1931, Mr. Hewitt left Washington, D. C., on field duty and returned to the bureau July 2, 1931. During this trip he

visited the Grand River grant of the Six Nations of Iroquois Indians dwelling near Brantford, Canada, and also the Tuscarora Reservation near Niagara Falls, N. Y.

Winslow M. Walker was appointed to the staff of the Bureau of American Ethnology as associate anthropologist in March, 1931. He resumed his research in Hawaiian archeology, begun during a year's stay in the Hawaiian Islands in 1929, in preparation for a paper on Hawaiian sculpture.

In preparation for work in the field Mr. Walker undertook research in the early narratives of exploration in Louisiana and Arkansas. He left Washington May 29 to investigate some caves in the vicinity of Gilbert, Ark., in the Ozark Mountains, with the hope of being able to throw new light on the Ozark bluff dwellers and other early inhabitants of the caves. Sixteen caves were explored and excavations were made in several of the most promising. A large cave at Cedar Grove yielded several skeletons and a considerable number of stone, flint, and bone artifacts. As the fiscal year closed Mr. Walker was still engaged in excavating this cavern. He intends to make a brief survey of certain mounds and village sites along the Red River Valley in the northern part of Louisiana on the completion of his work in Arkansas.

SPECIAL RESEARCHES

The study of Indian music for the Bureau of American Ethnology has been carried forward during the past year by Miss Frances Densmore. The three phases of this research are (1) the recording of songs and collecting of other material in the field, including the purchase of specimens; (2) the transcription and analysis of songs, with the development of information; and (3) the preparation of material for publication. All these phases have received attention during the year, and the songs of three hitherto unstudied localities have been recorded.

Early in July, 1930, Miss Densmore went to Grand Portage, an isolated Chippewa village on Lake Superior, near the Canadian boundary. This village was visited in 1905, a ceremony was witnessed, and one of its songs written down; therefore a return to Grand Portage was particularly interesting. The purpose of the trip was to witness the Chippewa dances on the Fourth of July, but she remained more than three weeks, continuing her study of native customs. Several songs of the *wabunowin* were heard and translated, these resembling the songs of the Grand Medicine, which formed a subject of intensive study during 1907–1911. She also witnessed the tipi-shaking of an Indian medicine man and listened to his songs for almost an hour. This performance is very rare at the present

time. Although the evening was quiet, the tipi was seen to sway as though buffeted by a tempest, then remain motionless a few seconds and again shake convulsively. This was continuous while Miss Densmore watched the performance and was said to have continued several hours afterwards. Inside the tipi sat the medicine man, believed to be talking with spirits whom he had summoned, the spirits making known their presence by the shaking of the conical structure. The next day the medicine man said that he had summoned the spirits in order to ascertain whether his treatment of a certain sick man would be successful. He said that if the spirits "spoke loud and clear" the man would recover, but if their voices were faint the man would die. The response was said to have been satisfactory, and accordingly he instituted a "beneficial dance," which was attended by Miss Densmore, and the songs heard for a considerable time. These, like the songs in the tipi, resembled the songs of the Chippewa Grand Medicine Society.

The study of Indian music was continued by a trip to Kilbourn, Wis., during August and September. Two pageants are given simultaneously at The Dalles of the Wisconsin River, near Kilbourn, each employing about 100 Indians. In the pageants the swan and hoop dance, as well as war and social dances of the Winnebago, were seen. The dances of other tribes presented in the pageants included the eagle dance and other pueblo dances. Songs of the swan, hoop, and frog dances were later recorded by leading pageant singers.

At Kilbourn Miss Densmore recorded numerous songs of Pueblo Indians from Isleta and Cochiti, these consisting chiefly of corn-grinding and war songs. The words of these songs are highly poetic and many of the melodies resemble Acoma songs in structure.

As John Bearskin and his family were traveling from Kilbourn to their home in Nebraska they passed through Red Wing, Minn., and songs were recorded at Miss Densmore's home. Bearskin recorded three complete sets of the Winnebago medicine lodge songs and a set of Buffalo feast songs.

In January, 1931, Miss Densmore went to Washington, where she worked on the preparation of material for publication, and proceeded thence to Miami, Fla., where she began a study of Seminole music, recording songs of the corn dance from the man who leads the singing in that ceremony; also the songs that precede a hunting expedition. The customs of the Seminole were studied and a collection of specimens was obtained. This collection includes two complete costumes and is now the property of the United States National Museum.

The second phase of the research is represented by eight manuscripts which include the transcriptions and analyses of 77 songs and

two flute melodies recorded by Winnebago, Isleta, Cochiti, and Seminole Indians. The cumulative analyses of Indian songs has been continued and now comprises 1,553 songs. The 14 tables submitted during this year constitute a comparison between a large series of Nootka and Quileute songs and the songs previously analyzed by the same method.

The third phase of work comprised the preparation for publication of "Menominee Music" and "Acoma Music."

Frank M. Setzler, assistant curator, division of archeology, United States National Museum, was detailed to the bureau for the purpose of conducting an archeological investigation in Texas. After briefly examining several sites at Victoria and Brownsville along the Gulf coast, he excavated four caves and one rock shelter on the Mollie B. Knight ranch, in Presidio County, and visited several other caverns in the vicinity.

From one large cave a total of 70 specimens, including baskets, matting, cradles, sandals, beads, corn, gourd shards, and one skeleton, were recovered. No pottery or evidence of European influence was found. Although the site is only 150 miles east of a marginal Basket-maker culture, no local trace was found of these early southwestern people. The material differs in some respects from any other in the Museum and more research will be required before it can be definitely identified.

EDITORIAL WORK AND PUBLICATIONS

The editing of the publications of the bureau was continued through the year by Stanley Searles, editor, assisted by Mrs. Frances S. Nichols, editorial assistant. The status of the publications is presented in the following summary:

PUBLICATIONS ISSUED

Forty-fifth Annual Report. Accompanying papers: The Salishan Tribes of the Western Plateaus (Teit, edited by Boas); Tattooing and Face and Body Painting of the Thompson Indians, British Columbia (Teit, edited by Boas); The Ethnobotany of the Thompson Indians of British Columbia (Steedman); The Osage Tribe; Rite of the Wa-xo-be (LaFlesche). vii+857 pp., 29 pls., 47 figs.

Forty-sixth Annual Report. Accompanying papers; Anthropological Survey in Alaska (Hrdlička); Report to the Honorable Isaac S. Stevens, Governor of Washington Territory, on the Indian Tribes of the Upper Missouri (Denig, edited by Hewitt). vii+654 pp., 80 pls., 35 figs.

Bulletin 96. Early Pueblo Ruins in the Piedra District, Southwestern Colorado (Roberts). ix+190 pp., 55 pls., 40 figs.

Bulletin 97. The Kamia of Imperial Valley (Gifford). vii+94 pp., 2 pls., 4 figs.

Bulletin 100. The Ruins at Kiatuthlanna, Eastern Arizona (Roberts). viii +195 pp., 47 pls., 31 figs.

PUBLICATIONS IN PRESS

Forty-seventh Annual Report. Accompanying papers: The Acoma Indians (White); Isleta, New Mexico (Parsons); Introduction to Zuñi Ceremonialism, and Zuñi Origin Myths (Bunzel); Zuñi Ritual Poetry (Bunzel); Zuñi Katcinas (Bunzel).

Bulletin 94. Tobacco Among the Karuk Indians of California (Harrington).

Bulletin 98. Tales of the Cochiti Indians (Benedict).

Bulletin 99. Cherokee Sacred Formulas and Medicinal Prescriptions (Mooney and Olbrechts).

Bulletin 101. Indian Blankets of the North Pacific Coast (Kissell).

Bulletin 102. Menominee Music (Densmore).

Bulletin 103. Source Material for the Social and Ceremonial Life of the Choctaw Indians (Swanton).

Bulletin 104. A Survey of the Ruins in the Region of Flagstaff, Arizona (Colton).

Bulletin 105. Notes on the Wapanowiweni (Michelson).

DISTRIBUTION OF PUBLICATIONS

The distribution of the publications of the bureau has been continued under the charge of Miss Helen Munroe, assisted by Miss Emma B. Powers. Publications distributed were as follows:

Report volumes and separates	6,003
Bulletins and separates	13,924
Contributions to North American Ethnology	33
Miscellaneous publications	515
Total	20,475

As compared with the fiscal year ending June 30, 1930, there was a decrease of 4,393. This decrease is mainly in the distribution of bulletins and separates, and possibly is largely explained by the very large number of separates from the handbook which were sent in the previous year to the many groups of Camp Fire Girls. No great demand from any one group was received in this past fiscal year.

Twenty-eight addresses were added to the mailing list during the year and 20 were taken off. The mailing list now stands at 1,635, in addition to the members of the staff of the bureau and other branches of the Institution who receive the publications regularly as issued.

ILLUSTRATIONS

Following is a summary of work accomplished in the illustration branch of the bureau under the supervision of De Lancey Gill, illustrator:

Photographs and drawings retouched, lettered, and otherwise made ready for engraving	748
Drawings made, including maps, diagrams, etc	48

Engravers' proofs criticized	524
Printed editions of colored plates examined at Government Printing Office	7,000
Correspondence attended to (letters)	135
Photographs selected and catalogued for private publication	310
Photo-laboratory work by Dr. A. J. Olmsted, National Museum, in cooperation with the Bureau of American Ethnology:	
Negatives	154
Prints	335
Lantern slides	91
Films developed from field exposures	48

During the early part of the calendar year Miss Mae W. Tucker was detailed to this branch to assist in listing and cataloguing the great collection of Indian negatives already classified by Mr. Gill in previous years. Of the purely ethnologic subjects, including portraits, arts, and industries, the list will embrace more than 7,000 units. This work, so long delayed, has progressed most satisfactorily.

LIBRARY

The reference library has continued under the care of Miss Ella Leary, librarian, assisted by Thomas Blackwell.

During the year 600 volumes were accessioned, of which 97 were acquired by purchase, 100 by binding of periodicals, and 403 by gift and exchange; also 190 pamphlets and 3,500 serials, chiefly the publications of learned societies, were received and recorded, of which 28 were obtained by purchase, the remainder being received through exchange, giving us at the close of the year a working library of 26,671 volumes, 16,717 pamphlets, and several thousand unbound periodicals. Books loaned during the year numbered 975 volumes. During the year 473 volumes were bound. In addition to the use of its own library, which is becoming more valuable through exchange and by limited purchase, it was found necessary to draw on the Library of Congress for the loan of about 250 volumes, and in turn the bureau library was frequently consulted by officers of other Government establishments, as well as by students not connected with the Smithsonian Institution. The purchase of books and periodicals has been restricted to such as relate to the bureau's researches. During the year the cataloguing has been carried on as new accessions were acquired and good progress was made in cataloguing ethnologic and related articles in the earlier serials. The catalogue was increased by the addition of 3,500 cards. A considerable amount of reference work was done in the usual course of the library's service to investigators and students, both in the Smithsonian Institution and outside.

COLLECTIONS

Accession No.

111046. Human skeletal material from a gravel bed along the Patuxent River, Md., collected by T. Dale Stewart on June 16, 1930. (12 specimens.)

111697. About 100 crania and parts of skeletons from Safety Harbor, Fla., collected by M. W. Stirling. (139 specimens.)

111961. Miniature clay toys made by Navajo Indian children and collected by Dr. W. H. Spinks at Chin Lee, Ariz., and 15 snapshots. (37 specimens.)

112277. Collection of 802 ivory specimens, etc., secured by Dr. A. Hrdlička along the Kuskokwim in 1930 from funds supplied by the bureau. (802 specimens.)

112393. Archeological and skeletal material collected by Dr. F. H. H. Roberts, jr., during the summer of 1929 from a site in Arizona. (553 specimens.)

112888. Archeological material from the vicinity of Tampa Bay, Fla., collected by M. W. Stirling in 1930. (115 specimens.)

114648. Skeletal material from Horrs Island, Collier County, Fla., collected during February and March, 1931, by M. W. Stirling. (150 specimens.)

PROPERTY

Office equipment was purchased to the amount of $571.25.

MISCELLANEOUS

The correspondence and other clerical work of the office has been conducted by Miss May S. Clark, clerk to the chief, assisted by Anthony W. Wilding, clerk. Miss Mae W. Tucker, stenographer, was engaged in copying manuscript material for Doctor Swanton and in assisting Mr. Hewitt in his work as custodian of manuscripts and phonograph records. The manuscript Dictionary of * * * Indian Languages of North, Central, and South America and the West Indies, compiled by W. R. Gerard, which was in danger of becoming illegible due to the frayed condition of the paper on which it was written and the faded writing, has been copied by Miss Tucker. Work was begun on the catalogue of the photographic negatives belonging to the bureau. To date approximately 7,000 negatives have been listed.

During the course of the year information was furnished by members of the staff in reply to numerous inquiries concerning the North American Indians, both past and present, and the Mexican peoples of the prehistoric and early historic periods to the south. Various specimens sent to the bureau were identified and data on them furnished for their owners.

Personnel.—Winslow M. Walker was appointed as associate anthropologist on the staff of the bureau on March 6, 1931.

Miss May S. Clark, clerk, retired June 30, 1931.

Respectfully submitted.

M. W. Stirling, *Chief.*

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

APPENDIX 5

REPORT ON THE INTERNATIONAL EXCHANGE SERVICE

SIR: I have the honor to submit the following report on the operations of the International Exchange Service during the fiscal year ending June 30, 1931:

The appropriation granted by Congress for the support of the system of international exchanges during the year was $52,810, an increase of $1,513 over the amount allowed for the preceding year. Of this increase, $1,000 was for freight, $160 to cover the additional sum required to meet the provisions of the Brookhart Act amending section 13 of the classification act of 1923, and $353 to advance to the next step in their respective grades those of the employees of the exchange office eligible for promotion. The repayments from departmental and other establishments aggregated $5,000.57, making the total available resources for conducting the service during 1931 $57,810.57.

The total number of packages handled was 641,338, a decrease from the previous year of 53,327 (7.7 per cent). The weight of these packages was 642,190 pounds, a falling off of 65,904 pounds (9.3 per cent). These decreases no doubt were due to the world-wide depression. However, the economic condition affected the output of literature more abroad than in the United States, as will be noted when it is stated that the number of packages sent through the International Exchange Service decreased only 6 per cent, while those received from abroad decreased nearly 22 per cent.

The publications passing through the service are classified as parliamentary documents, departmental documents, and miscellaneous scientific and literary publications. The number and weight of the packages containing the publications coming under these different headings are as follows:

	Packages		Weight	
	Sent	Received	Sent	Received
			Pounds	*Pounds*
United States parliamentary documents sent abroad	261,155		114,619	
Publications received in return for parliamentary documents		10,331		29,196
United States departmental documents sent abroad	191,266		155,089	
Publications received in return for departmental documents		8,020		24,076
Miscellaneous scientific and literary publications sent abroad	132,737		229,280	
Miscellaneous scientific and literary publications received from abroad for distribution in the United States		37,829		89,930
Total	585,158	56,180	498,988	143,202
Grand total	641,338		642,190	

During the year 3,002 boxes were shipped abroad, a decrease from the number for the preceding 12 months of 233, a little over 7 per cent. Of the total number of boxes, 692 contained full sets of United States official documents for authorized depositories abroad, and the remainder (2,310) were filled with publications for miscellaneous correspondents. The boxes measured 16,003 cubic feet.

The number of boxes sent to each country is given in the following table:

Consignments of exchanges forwarded to foreign countries

Country	Number of boxes	Country	Number of boxes
Albania	10	Latvia	22
Argentina	65	Lithuania	2
Austria	50	Mexico	11
Belgium	73	Netherlands	88
Brazil	55	New South Wales	48
British Colonies	13	New Zealand	31
Bulgaria	3	Norway	46
Canada	44	Palestine	48
Chile	38	Persia	2
China	89	Peru	27
Colombia	25	Poland	69
Costa Rica	23	Portugal	24
Cuba	11	Queensland	25
Czechoslovakia	67	Rumania	24
Danzig	1	Russia	165
Denmark	55	South Australia	26
Egypt	20	Spain	38
Estonia	22	Sweden	95
Finland	19	Switzerland	84
France	183	Tasmania	21
Germany	383	Turkey	10
Great Britain and Ireland	236	Ukraine	61
Greece	2	Union of South Africa	58
Guatemala	2	Uruguay	24
Haiti	3	Venezuela	33
Hungary	40	Victoria	46
India	77	Western Australia	20
Italy	119	Yugoslavia	19
Japan	106		
Korea	1	Total	3,002

As explained in previous reports, in addition to the packages forwarded abroad in boxes for distribution by foreign exchange bureaus, many are transmitted direct to their destinations by mail—some because it is more economical to send by mail than by freight; some, like the daily issue of the Congressional Record, because treaty stipulations provide that they shall be so forwarded; and some for the reason that they are for places remote from existing exchange agencies. The total number of packages transmitted by mail during the year was 76,609, an increase over last year of 8,664.

Last year mention was made that nine boxes of exchanges from Germany were destroyed at the steamship pier in New York through the burning and sinking of the vessel on board of which the boxes were being transmitted to this country. I regret to report that during the current fiscal year eight boxes for China met a similar fate at the pier in New York, the steamship *President Harrison*, on board

of which the consignment had been placed for transmission to China, having been destroyed by fire and water.

As usual, assistance was rendered during the year to the Library of Congress in procuring for its division of documents copies of various foreign governmental publications missing in its collections. Aid also was given to a number of establishments, both here and abroad, in obtaining specially desired publications. For this service, as well as for the help in the distribution of exchanges, letters of appreciation are often received by the Institution from its correspondents.

FOREIGN DEPOSITORIES OF GOVERNMENTAL DOCUMENTS

There are now forwarded to foreign depositories of United States official documents 112 sets—62 full and 50 partial—an increase of three over the number transmitted last year. Afghanistan, Bengal, and the Vatican Library were added to the list of those countries receiving partial sets. Greece, to which the shipment of a full set was temporarily suspended, has been listed to receive a partial set. The partial set sent to Alsace-Lorraine has been discontinued.

The address to which the partial set for Guatemala was forwarded has been changed from the Secretaria de Relaciones Exteriores to the Biblioteca Nacional. The depository in Poland to which a full set of Government documents is forwarded has been changed by the Polish Government from the Library of the Ministry of Foreign Affairs to the National Library in Warsaw.

A complete list of the depositories is given below:

DEPOSITORIES OF FULL SETS

ARGENTINA: Ministerio de Relaciones Exteriores, Buenos Aires.
BUENOS AIRES: Boblioteca de la Universidad Nacional de La Plata, La Plata.
(Depository of the Province of Buenos Aires.)
AUSTRALIA: Library of the Commonwealth Parliament, Canberra.
NEW SOUTH WALES: Public Library of New South Wales, Sydney.
QUEENSLAND: Parliamentary Library, Brisbane.
SOUTH AUSTRALIA: Parliamentary Library, Adelaide.
TASMANIA: Parliamentary Library, Hobart.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
AUSTRIA: Bundeskanzleramt, Herrengasse 23, Vienna I.
BELGIUM: Bibliothèque Royale, Brussels.
BRAZIL: Bibliotheca Nacional, Rio de Janeiro.
CANADA: Library of Parliament, Ottawa.
MANITOBA: Provincial Library, Winnipeg.
ONTARIO: Legislative Library, Toronto.
QUEBEC: Library of the Legislature of the Province of Quebec.

CHILE: Biblioteca del Congreso Nacional, Santiago.
CHINA: Bureau of International Exchange, Academia Sinica, Shanghai.
COLOMBIA: Biblioteca Nacional, Bogotá.
COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San José.
CUBA: Secretaría de Estado (Asuntos Generales y Canje Internacional), Habana.
CZECHOSLOVAKIA: Bibliothèque de l'Assemblée Nationale, Prague.
DENMARK: Kongelige Bibliotheket, Copenhagen.
EGYPT: Bureau des Publications, Ministère des Finances, Cairo.
ESTONIA: Riigiraamatukogu (State Library), Tallinn (Reval).
FRANCE: Bibliothèque Nationale, Paris.
PARIS: Préfecture de la Seine.
GERMANY: Reichstauschstelle im Reichsministerium des Innern, Berlin C 2.
BADEN: Universitäts-Bibliothek, Freiburg. (Depository of the State of Baden.)
BAVARIA: Bayerische Staatsbibliothek, Munich.
PRUSSIA: Preussische Staatsbibliothek, Berlin, N. W. 7.
SAXONY: Sächsische Landesbibliothek, Dresden—N. 6.
WURTEMBURG: Landesbibliothek, Stuttgart.
GREAT BRITAIN:
ENGLAND: British Museum, London.
GLASGOW: City Librarian, Mitchell Library, Glasgow.
LONDON: London School of Economics and Political Science. (Depository of the London County Council.)
HUNGARY: Hungarian House of Delegates, Budapest.
INDIA: Imperial Library, Calcutta.
IRISH FREE STATE: National Library of Ireland, Dublin.
ITALY: Ministero dell'Educazione Nazionale, Rome.
JAPAN: Imperial Library of Japan, Tokyo.
LATVIA: Bibliothèque d'Etat, Riga.
MEXICO: Biblioteca Nacional, Mexico, D. F.
NETHERLANDS: Royal Library, The Hague.
NEW ZEALAND: General Assembly Library, Wellington.
NORTHERN IRELAND: Ministry of Finance, Belfast.
NORWAY: Universitets-Bibliotek, Oslo. (Depository of the Government of Norway.)
PERU: Biblioteca Nacional, Lima.
POLAND: Bibliothèque Nationale, Warsaw.
PORTUGAL: Biblioteca Nacional, Lisbon.
RUMANIA: Academia Română, Bucharest.
RUSSIA: Shipments temporarily suspended.
SPAIN: Oficina Española de Cambio Internacional, Paseo de Recoletos 20, Madrid.
SWEDEN: Kungliga Biblioteket, Stockholm.
SWITZERLAND:
Bibliothèque Centrale Fédérale, Berne.
Library of the League of Nations, Geneva.
TURKEY: Ministère de l'Instruction Publique, Ankara.
UNION OF SOUTH AFRICA: State Library, Pretoria, Transvaal.
URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
VENEZUELA: Biblioteca Nacional, Caracas.
YUGOSLAVIA: Ministère de l'Éducation, Belgrade.

DEPOSITORIES OF PARTIAL SETS

AFGHANISTAN: Ministry of Foreign Affairs, Publications Department, Kabul.
AUSTRIA:
Vienna: Magistrat der Stadt Wien, Abteilung 51-Statistik.
BOLIVIA: Biblioteca del H. Congreso Nacional, La Paz.
BRAZIL:
MINAS GERAES: Directoria Geral de Estatistica em Minas, Bello Horizonte.
RIO JANEIRO: Bibliotheca da Assemblea Legislativa do Estado, Nictheroy.
BRITISH GUIANA: Government Secretary's Office, Georgetown, Demerara.
BULGARIA: Ministère des Affaires Étrangères, Sofia.
CANADA:
ALBERTA: Provincial Library, Edmonton.
BRITISH COLUMBIA: Legislative Library, Victoria.
NEW BRUNSWICK: Legislative Library, Fredericton.
NOVA SCOTIA: Provincial Secretary of Nova Scotia, Halifax.
PRINCE EDWARD ISLAND: Legislative Library, Charlottetown.
SASKATCHEWAN: Government Library, Regina.
CEYLON: Colonial Secretary's Office (Record Department of the Library), Colombo.
CHINA: National Library, Peiping.
DANZIG: Stadtbibliothek, Free City of Danzig.
DOMINICAN REPUBLIC: Biblioteca del Senado, Santo Domingo.
ECUADOR. Biblioteca Nacional, Quito.
FINLAND: Parliamentary Library, Helsingfors.
GERMANY:
BREMEN: Senatskommission für Reichs- und Auswärtige Angelegenheiten.
HAMBURG: Senatskommission für Reichs- und Auswärtige Angelegenheiten.
HESSE: Universitäts-Bibliothek, Giessen.
LÜBECK: President of the Senate.
THURINGIA: Rothenberg-Bibliothek, Landesuniversität, Jena.
GREECE: Library of Parliament, Athens.
GUATEMALA: Biblioteca Nacional, Guatemala.
HAITI: Secrétaire d'État des Relations Extérieures, Port au Prince.
HONDURAS: Biblioteca y Archivo Nacionales, Tegucigalpa.
ICELAND: National Library, Reykjavik.
INDIA:
ASSAM: General and Judicial Department, Shillong.
BENGAL: Education Department, Government of Bengal, Darjeeling.
BIHAR and ORISSA: Revenue Department, Patna.
BOMBAY: Undersecretary to the Government of Bombay, General Department, Bombay.
BURMA: Secretary to the Government of Burma, Education Department, Rangoon.
CENTRAL PROVINCES: General Administration Department, Nagpur.
MADRAS: Chief Secretary to the Government of Madras, Public Department, Madras.
PUNJAB: Chief Secretary to the Government of the Punjab, Lahore.
UNITED PROVINCES OF AGRA AND OUDH: University of Allahabad, Allahabad.
JAMAICA: Colonial Secretary, Kingston.
LIBERIA: Department of State, Monrovia.
LITHUANIA: Ministère des Affaires Étrangères, Kaunas (Kovno).
MALTA: Minister for the Treasury, Valetta.

NEWFOUNDLAND: Colonial Secretary, St. Johns.
NICARAGUA: Superintendente de Archivos Nacionales, Managua.
PANAMA: Secretaría, de Relaciones Exteriores, Panama.
PARAGUAY: Sección Canje Internacional de Publicaciones del Ministerio de Relaciones Exteriores, Estrella, 563, Asunción.
SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
SIAM: Department of Foreign Affairs, Bangkok.
STRAITS SETTLEMENTS: Colonial Secretary, Singapore.
VATICAN CITY: Biblioteca Apostolica Vaticana, Vatican City, Rome, Italy.

INTERPARLIAMENTARY EXCHANGE OF THE OFFICIAL JOURNAL

The number of copies of the daily issue of the Congressional Record forwarded to foreign legislative bodies and other governmental establishments is 102, the same as last year.

There is given below a complete list of the States taking part in the immediate exchange of the official journal, together with the names of the establishments to which the Record is mailed:

DEPOSITORIES OF CONGRESSIONAL RECORD

ARGENTINA:
Biblioteca del Congreso Nacional, Buenos Aires.
Cámara de Diputados, Oficina de Información Parlamentaria, Buenos Aires.
Buenos Aires: Biblioteca del Senado de la Provincia de Buenos Aires, La Plata.
AUSTRALIA:
Library of the Commonwealth Parliament, Canberra.
NEW SOUTH WALES: Library of Parliament of New South Wales, Sydney.
QUEENSLAND: Chief Secretary's Office, Brisbane.
WESTERN AUSTRALIA: Library of Parliament of Western Australia, Perth.
AUSTRIA: Bibliothek des Nationalrates, Vienna I.
BELGIUM: Bibliothèque de la Chambre des Représentants, Brussels.
BOLIVIA: Biblioteca del H. Congreso Nacional, La Paz.
BRAZIL:
Bibliotheca do Congresso Nacional, Rio de Janeiro.
AMAZONAS: Archivo, Bibliotheca e Imprensa Publica, Manáos.
BAHIA: Governador do Estado de Bahia, São Salvador.
ESPIRITO SANTO: Presidencia do Estado do Espirito Santo, Victoria.
RIO GRANDE DO SUL: "A Federação," Porto Alegre.
SERGIPE: Director da Imprensa Official, Aracaju.
SÃO PAULO: Diario Official do Estado de São Paulo, São Paulo.
BRITISH HONDURAS: Colonial Secretary, Belize.
CANADA:
Library of Parliament, Ottawa.
Clerk of the Senate, Houses of Parliament, Ottawa.
CHINA: National Library, Pei Hai, Peking.
CUBA:
Biblioteca de la Cámara de Representantes, Habana.
Biblioteca del Senado, Habana.
CZECHOSLOVAKIA: Bibliothèque de l'Assemblée Nationale, Prague.
DANZIG: Stadtbibliothek, Danzig.
DENMARK: Rigsdagens Bureau, Copenhagen.

DOMINICAN REPUBLIC: Biblioteca del Senado, Santo Domingo.
DUTCH EAST INDIES: Volksraad von Nederlandsch-Indië, Batavia, Java.
EGYPT: Bureau des Publications, Ministère des Finances, Cairo.
ESTONIA: Riigiraamatukogu (State Library), Tallinn (Reval).
FRANCE:
Chambre des Députés, Service de l'Information Parlementaire Étrangère, Paris.
Bibliothèque du Sénat, au Palais du Luxembourg, Paris.
GERMANY:
Deutsche Reichstags-Bibliothek, Berlin, N. W. 7.
ANHALT: Anhaltische Landesbücherei, Dessau.
BADEN: Universitäts-Bibliothek, Heidelberg.
BRAUNSCHWEIG: Bibliothek des Braunschweigischen Staatsministeriums, Braunschweig.
MECKLENBURG-SCHWERIN: Staatsministerium, Schwerin.
MECKLENBURG-STRELITZ: Finanzdepartement des Staatsministeriums, Neustrelitz.
OLDENBURG: Oldenburgisches Staatsministerium, Oldenburg i. O.
PRUSSIA: Bibliothek des Preussischen Landtages, Prinz Albrecht Strasse 5, Berlin, S. W. 11.
SCHAUMBURG-LIPPE: Schaumburg-Lippische Landesregierung, Bücheburg.
GIBRALTAR: Gibraltar Garrison Library Committee, Gibraltar.
GREAT BRITAIN: Library of the Foreign Office, London.
GREECE: Library of Parliament, Athens.
GUATEMALA: Archivo General del Gobierno, Guatemala.
HONDURAS: Biblioteca del Congreso Nacional, Tegucigalpa.
HUNGARY: Bibliothek des Abgeordnetenhauses, Budapest.
INDIA: Legislative Department, Simla.
IRAQ: Chamber of Deputies, Bagdad, Iraq (Mesopotamia).
IRISH FREE STATE: Dail Eireann, Dublin.
ITALY:
Biblioteca della Camera dei Deputati, Rome.
Biblioteca del Senato del Regno, Rome.
Ufficio degli Studi Legislativi, Senato del Regno, Rome.
LATVIA: Library of the Saeima, Riga.
LIBERIA: Department of State, Monrovia.
MEXICO: Secretaria de la Cámara de Diputados, Mexico, D. F.
AGUASCALIENTES: Gobernador del Estado de Aguascalientes, Aguascalientes.
CAMPECHE: Gobernador del Estado de Campeche, Campeche.
CHIAPAS: Gobernador del Estado de Chiapas, Tuxtla Gutierrez.
CHIHUAHUA: Gobernador del Estado de Chihuahua, Chihuahua.
COAHUILA: Periódico Oficial del Estado de Coahuila, Palacio de Gobierno, Saltillo.
COLIMA: Gobernador del Estado de Colima, Colima.
DURANGO: Gobernador Constitucional del Estado de Durango, Durango.
GUANAJUATO: Secretaría General de Gobierno del Estado, Guanajuato.
GUERRERO: Gobernador del Estado de Guerrero, Chilpancingo.
JALISCO: Biblioteca del Estado, Guadalajara.
LOWER CALIFORNIA: Gobernador del Distrito Norte, Mexicali, B. C., Mexico.
MEXICO: Gaceta del Gobierno, Toluca, Mexico.
MICHOACÁN: Secretaría General de Gobierno del Estado de Michoacán, Morelia.
MORELOS: Palacio de Gobierno, Cuernavaca

MEXICO—Continued.
NAYARIT: Gobernador de Nayarit, Tepic.
NUEVO LEON: Biblioteca del Estado, Monterey.
OAXACA: Periódico Oficial, Palacio de Gobierno, Oaxaca.
PUEBLA: Secretaría General de Gobierno, Zaragoza.
QUERETARO: Secretaría General de Gobierno, Sección de Archivo, Queretaro.
SAN LUIS POTOSI: Congreso del Estado, San Luis Potosi.
SINALOA: Gobernador del Estado de Sinaloa, Culiacan.
SONORA: Gobernador del Estado de Sonora, Hermosillo.
TABASCO: Secretaría General de Gobierno, Sección 3a, Ramo de Prensa, Villahermosa.
TAMAULIPAS: Secretaría General de Gobierno, Victoria.
TLAXCALA: Secretaría de Gobierno del Estado, Tlaxcala.
VERA CRUZ: Gobernador del Estado de Vera Cruz, Departamento de Gobernacion y Justicia, Jalapa.
YUCATÁN: Gobernador del Estado de Yucatán, Mérida, Yucatán.
NEW ZEALAND: General Assembly Library, Wellington.
NORWAY: Storthingets Bibliothek, Oslo.
PERSIA: Library of the Persian Parliament, Téhéran.
PERU: Cámara de Diputados, Congreso Nacional, Lima.
POLAND: Ministère des Affaires Étrangères, Warsaw.
PORTUGAL: Biblioteca do Congresso da Republica, Lisbon.
RUMANIA:
Bibliothèque de la Chambre des Députés, Bucharest.
Ministère des Affaires Étrangères, Bucharest.
SPAIN:
Biblioteca del Congreso Nacional, Madrid.
BARCELONA: Biblioteca de la Comisión Permanente Provincial de Barcelona, Barcelona.
SWITZERLAND:
Bibliothèque de l'Assemblée Fédérale Suisse, Berne.
Library of the League of Nations, Geneva.
SYRIA:
Ministère des Finances de la République Libanaise. Service du Matériel, Beirut.
Governor of the State of Alaouites, Lattaquié.
TURKEY: Turkish Grand National Assembly, Ankara.
UNION OF SOUTH AFRICA:
Library of Parliament, Cape Town, Cape of Good Hope.
State Library, Pretoria, Transvaal.
URUGUAY: Biblioteca de la Cámara de Representantes, Montevideo.
VENEZUELA: Cámara de Diputados, Congreso Nacional, Carácas.

FOREIGN EXCHANGE AGENCIES

The Polish Service of International Exchanges has been detached from the Ministry of Foreign Affairs and transferred to the National Library.

The Spanish Office of International Exchange was reorganized in October, 1930, and is now under the Ministry of Public Instruction.

A list of the agencies abroad through which the distribution of exchanges is effected is given below. Most of these agencies forward consignments to the Institution for distribution in the United States.

LIST OF EXCHANGE AGENCIES

ALGERIA, via France.
ANGOLA, via Portugal.
ARGENTINA: Comisión Protectora de Bibliotecas Populares, Calle Córdoba 931, Buenos Aires.
AUSTRIA: Internationale Austauschstelle, Bundeskanzleramt, Herrengasse 23, Vienna I.
AZORES, via Portugal.
BELGIUM: Service Belge des Échanges Internationaux, Rue des Longs-Chariots, 46, Brussels.
BOLIVIA: Oficina Nacional de Estadistica, La Paz.
BRAZIL: Serviço de Permutações Internacionaes, Bibliotheca Nacional, Rio de Janeiro.
BRITISH COLONIES: Crown Agents for the Colonies, London.
BRITISH GUIANA: Royal Agricultural and Commercial Society, Georgetown.
BRITISH HONDURAS: Colonial Secretary, Belize.
BULGARIA: Institutions Scientifiques de S. M. le Roi de Bulgarie, Sofia.
CANADA: Sent by mail.
CANARY ISLANDS, via Spain.
CHILE: Servicio de Canjes Internacionales, Biblioteca Nacional, Santiago.
CHINA: Bureau of International Exchange, Academia Sinica, 331 Avenue du Roi Albert, Shanghai.
COLOMBIA: Oficina de Canjes Internacionales y Reparto, Biblioteca Nacional, Bogota.
COSTA RICA: Oficina de Depósito y Canje Internacional de Publicaciones, San Jose.
CUBA: Sent by mail.
CZECHOSLOVAKIA: Service Tchécoslovaque des Échanges Internationaux, Bibliothèque de l'Assemblée Nationale, Prague 1–79.
DANZIG: Amt für den Internationalen Schriftenaustausch der Freien Stadt Danzig, Stadtbibliothek, Danzig.
DENMARK: Service Danois des Échanges Internationaux, Kongelige Danske Videnskabernes Selskab, Copenhagen.
DUTCH GUIANA: Surinaamsche Koloniale Bibliotheek, Paramaribo.
ECUADOR: Ministerio de Relaciones Exteriores, Quito.
EGYPT: Bureau des Publications, Ministère des Finances, Cairo.
ESTONIA: Riigiraamatukogu (State Library), Tallinn (Reval).
FINLAND: Delegation of the Scientific Societies of Finland, Helsingfors.
FRANCE: Service Français des Échanges Internationaux, 110 Rue de Grenelle, Paris.
GERMANY: Amerika-Institut, Universitätstrasse 8, Berlin, N. W. 7.
GREAT BRITAIN AND IRELAND: Messrs. Wheldon & Wesley, 2, 3, and 4 Arthur St., New Oxford St., London W. C. 2.
GREECE: Bibliothèque Nationale, Athens.
GREENLAND, via Denmark.
GUATEMALA: Instituto Nacional de Varones, Guatemala.
HAITI: Secrétaire d'État des Relations Extérieures. Port-au-Prince.

HONDURAS: Biblioteca Nacional, Tegucigalpa.
HUNGARY: Hungarian Libraries Board, Budapest, IV.
ICELAND, via Denmark.
INDIA: Superintendent of Stationery, Bombay.
ITALY: R. Ufficio degli Scambi Internazionali, Ministero dell'Educazione Nazionale, Rome.
JAMAICA: Institute of Jamaica, Kingston.
JAPAN: Imperial Library of Japan, Tokyo.
JAVA, via Netherlands.
KOREA: Government General, Seoul.
LATVIA: Service des Échanges Internationaux, Bibliothèque d'État de Lettonie, Riga.
LIBERIA: Bureau of Exchanges, Department of State, Monrovia.
LITHUANIA: Sent by mail.
LOURENÇO MARQUEZ, via Portugal.
LUXEMBURG, via Belgium.
MADAGASCAR, via France.
MADEIRA, via Portugal.
MEXICO: Sent by mail.
MOZAMBIQUE, via Portugal.
NETHERLANDS: International Exchange Bureau of the Netherlands, Royal Library, The Hague.
NEW SOUTH WALES: Public Library of New South Wales, Sydney.
NEW ZEALAND: Dominion Museum, Wellington.
NICARAGUA: Ministerio de Relaciones Exteriores, Managua.
NORWAY: Service Norvégien des Échanges Internationaux, Bibliothèque de l'Université Royale, Oslo.
PALESTINE: Hebrew University Library, Jerusalem.
PANAMA: Sent by mail.
PARAGUAY: Sección Canje Internacional de Publicaciones del Ministerio de Relaciones Exteriores, Estrella 563, Asunción.
PERU: Oficina de Reparto, Depósito y Canje Internacional de Publicaciones, Ministerio de Fomento, Lima.
POLAND: Service Polonais des Échanges Internationaux, Bibliothèque Nationale, Warsaw.
PORTUGAL: Secção de Trocas Internacionaes, Biblioteca Nacional, Lisbon.
QUEENSLAND: Bureau of Exchanges of International Publications, Chief Secretary's Department, Brisbane.
RUMANIA: Bureau des Échanges Internationaux, Institut Météorologique Central, Bucharest.
RUSSIA: Academy of Sciences, Leningrad.
SALVADOR: Ministerio de Relaciones Exteriores, San Salvador.
SIAM: Department of Foreign Affairs, Bangkok.
SOUTH AUSTRALIA: South Australian Government Exchanges Bureau, Government Printing and Stationery Office, Adelaide.
SPAIN: Oficina Española de Cambio Internacional, Paseo de Recoletos 20, Madrid.
SUMATRA, via Netherlands.
SWEDEN: Kongliga Svenska Vetenskaps Akademien, Stockholm.
SWITZERLAND: Service Suisse des Échanges Internationaux, Bibliothèque Centrale Fédérale, Berne.
SYRIA: American University of Beirut.

TASMANIA: Secretary to the Premier, Hobart.
TRINIDAD: Royal Victoria Institute of Trinidad and Tobago, Port-of-Spain.
TUNIS, via France.
TURKEY: Robert College, Istanbul.
UNION OF SOUTH AFRICA: Government Printing Works, Pretoria, Transvaal.
URUGUAY: Oficina de Canje Internacional de Publicaciones, Montevideo.
VENEZUELA: Biblioteca Nacional, Caracas.
VICTORIA: Public Library of Victoria, Melbourne.
WESTERN AUSTRALIA: Public Library of Western Australia, Perth.
YUGOSLAVIA: Ministère des Affaires Étrangères, Belgrade.

Respectfully submitted.

C. W. SHOEMAKER,
Chief Clerk, International Exchange Service.

Dr. CHARLES G. ABBOT,
Secretary, Smithsonian Institution.

APPENDIX 6

REPORT OF THE NATIONAL ZOOLOGICAL PARK

SIR: I have the honor to submit the following report on the operations of the National Zoological Park for the fiscal year ending June 30, 1931:

The regular appropriation made by Congress for the maintenance of the park was $220,520, an increase of $17,520 over 1930. In order that plans and specifications might be prepared for a small mammal house before the convening of the next Congress, $4,500 was appropriated and made immediately available for this purpose. In addition an appropriation of $16,000 was provided in the second deficiency act for new boilers and conduits. The regular appropriation act also reappropriated $9,703 remaining unexpended under the bird-house appropriation of 1928 for grading and the construction of cages adjacent to the bird house. In the 1932 appropriation act $4,500 was also made available immediately upon approval of that act to provide for care of the Evans collection. Thus a total of $255,223 was available during the fiscal year. The regular appropriation, together with the additions, has made it possible to carry out some greatly needed repairs and improvements, and the work of the park has progressed in a very satisfactory manner.

ACCESSIONS

Gifts.—The outstanding gift of the year was the Victor J. Evans collection of 133 species and 244 individuals, which was bequeathed to the United States Government for the National Zoological Park by the late Victor J. Evans.

Mr. Evans for years had been deeply interested in animal life and had formed an unusually fine collection of rarities in his private zoo. These are listed among the donations and include two specimens of the white-crowned guenon (*Cercopithecus petronellae*), an exceedingly rare little monkey, regarding which practically nothing is known.

Mr. Evans had previously donated many rare species to the Zoo, among them the glacier bear, almost unique in captivity.

The reptile house created a great deal of interest throughout America, and a steady stream of gifts for the exhibition has been coming in ever since the house has been open.

Foster H. Benjamin, engaged in field work in Florida for the United States Department of Agriculture, has sent in many fine specimens; and we have profited very much through the field trips of Dr. Charles E. Burt, of Waxahachie, Tex., who has sent us the specimens picked up that he thought would be interesting to the Park. Dewey Moore, of Indio, Calif., has been on the alert and has sent a number of valuable specimens that we could not otherwise have obtained.

William K. Ryan, of Washington, D. C., a fancier of rare birds, has presented several especially desirable species.

The San Diego Zoo, of San Diego, Calif., contributed a collection of some of the California species of reptiles that are difficult to obtain.

In the late fall the director, on his vacation, visited Central America, and while at Tela, Honduras, he was presented such species as seemed desirable from the famous Tela Serpentarium. R. E. Stadelman, in charge of the laboratory, accompanied him on field collecting trips. The United Fruit Co. greatly facilitated the work, and thanks are due to R. K. Thomas and Dr. R. P. MacPhail for kindly hospitality and much aid. Incidentally the director collected various small species and through the aid of the honorable Secretary of Agriculture of Cuba and the chief of the Officina Sanidad Vegetal, Ernesto Sanchez Estrada, was enabled to bring home a flock of 20 Cuban flamingoes. The entire collection obtained on this trip was transported by the United Fruit Co. free of charge to New York, and every possible facility for the proper care of the specimens was afforded. This was most valuable assistance, which enabled the successful landing of specimens that might not otherwise have been procurable.

The United States Biological Survey of the Department of Agriculture and numerous members of its staff have contributed specimens to the Zoo and have assisted in making arrangements for other parties to supply us with specimens.

Dr. Alexander Wetmore and Frederick C. Lincoln on a trip to Haiti obtained and presented several specimens of two species of lizards not seen before in captivity.

An outstanding gift was that of three beautiful specimens of Kodiak bear cubs collected and presented by Senator Frederick Hale, of Maine. He caught these and brought them personally to Washington, where they are now thriving. As the National Zoological Park endeavors to maintain an especially good collection of Alaskan bears these cubs are a highly appreciated addition.

Practically all the plants placed in the reptile house as setting for animals were gifts from various branches of the United States Gov-

ernment and private individuals. The larger contributors were: Bureau of Plant Industry of the Department of Agriculture, the Office of Public Buildings and Public Parks, the United States Botanic Garden, Walter Reed Hospital, and San Diego Zoo.

ENDOWMENTS

The first endowments ever received by the Zoo were two given during the fiscal year 1931. The Frances Brincklé Zerbee Memorial Fund of $1,000 was given to the Smithsonian Institution by Maj. Leigh Zerbee, her husband, for the use of the National Zoological Park to maintain stock in aquariums. Mrs. Zerbee was particularly interested in fishes and other small aquatic forms and it was in recognition of her keen interest in such matters that Major Zerbee established this memorial fund. A bronze tablet has been placed in the reptile house over the aquaria in which this stock is to be maintained.

William S. Barstow of Great Neck, Long Island, presented $1,000 as an endowment in the name of his son, Frederic D. Barstow. This money has been invested and the income from it will be used to keep a cage in the zoo stocked with some interesting small mammal. Frederic D. Barstow, who died soon after this fund was established, was a keen enthusiast regarding birds and mammals and had made several trips to the Tropics for the purpose of collecting them.

The only previous contribution to the Zoo at all similar in character was the construction of the Beatrice Henderson cage for birds. This cage was built during the summer of 1912 by the late John B. Henderson, jr. It is about 24 by 40 by 26 feet, situated near the great flight cage, and now houses cockatoos of various kinds.

DONORS AND THEIR GIFTS

Thomas D. Bacon, Washington, D. C., woodchuck.

Dr. Paul Bartsch, Washington, D. C., 21 Bahama iguanas, 119 hermit crabs, 2 common iguanas, 4 marine turtles.

R. L. Bassett, Glenn Dale, Md., barred owl.

Dr. B. L. Beaines, Richmond, Va., great horned owl.

H. W. Belt, Hyattsville, Md., king snake.

J. E. Benedict, jr., N. C., 2 marbled salamanders.

Foster H. Benjamin, Orlando, Fla., through United States Department of Agriculture, bull snake, 2 worm lizards, garter snake, pine snake, diamondback rattlesnake, 2 hog-nosed snakes, water moccasin, ground rattlesnake, water snake, green snake, 2 indigo snakes, pigmy rattlesnake, 4 soft-shell turtles, 5 gopher tortoises, salamander, 4 alligators, bat, 3 frogs, 7 Florida box tortoises, painted turtle, Florida snapping turtle, Osceola snapping turtle, 2 fence lizards, 14 Florida cooters, musk turtle.

Jim Black, Pine Castle, Fla., 12 Florida cooters, 2 soft-shell turtles.

S. Bolay, New Orleans, La., 2 Texas king snakes.
Miss Isabelle Borders, Okmulgee, Okla., scarlet milk snake.
J. S. C. Boswell, Alexandria, Va., painted turtle, spotted turtle, 2 mole snakes.
M. K. Brady, Washington, D. C., painted turtle.
Edward E. Brand, Chambersburg, Pa., pilot snake.
F. R. Brown, Miami, Fla., water snake.
E. J. and S. K. Brown, Eustis, Fla., pine snake, king snake.
Dr. Charles E. Burt, Waxahachie, Tex., 5 Texas tree toads, California bull snake, 2 horned lizards, *Coleonyx brevis*, *Holbrookia propinqua*, 3 collared lizards, blind snake, spotted race runner, desert snake, ribbon snake, ringed snake, king snake, 2 western bull snakes, *Lampropeltis getulus holbrooki*, *Leiolopisma laterale*, *Natrix grahamii*, *Sceloporus undulatus undulatus*, DeKay's snake, *Tantilla gracilis*, *Thamnophis sauritus proximus*.
Miss Jane Cain, Washington, D. C., 2 alligators.
J. R. Cargill, Columbus, Ga., opossum.
F. G. Carnochan, New York, N. Y., 5 wood turtles.
E. B. Chamberlain, Charleston, S. C., 2 tree boas, 2 chicken snakes.
Mr. Chestnut, Hyattsville, Md., 2 opossums.
Miss Doris M. Cochran, Washington, D. C., 4 water snakes.
Colon Humane Society, through A. H. Pinney, Christobal, Canal Zone, gray fox.
Roger Conant, Toledo, Ohio, 2 fox snakes.
W. W. Conn, Washington, D. C., double-crested cormorant.
L. C. Cook, San Diego, Calif, 12 western swifts.
S. S. Crossley, through United States Biological Survey, Manila, Ark., blue goose.
Dr. J. F. Crowley, Washington, D. C., 2 alligators.
Mr. Curtis, Washington, D. C., screech owl.
Mrs. N. C. Damon, Chevy Chase, Md., alligator.
A. Mercer Daniel, Washington, D. C., scaup.
R. C. Deckert, Miami, Fla., blue-tailed skink.
William Domdera, Washington, D. C., emperor boa.
Vernon Dorman, Washington, D. C., 4 horned lizards.
W. I. Doty, through United States Forest Service, Washington, D. C., porcupine.
Mrs. B. M. Dugdale, Ashland, Va., Singapore grass monkey.
Charles Eaton, Washington, D. C., fence lizard.
David Eckhardt and Edwin Lecarpentir, Washington, D. C., water snake.
Dr. William O. Emery, Washington, D. C., 5 edible frogs, serrated frog, 7 midwife toads, 2 blind worms, European painted frog.
E. R. Erwin, Washington, D. C., Cooper's hawk.
Victor J. Evans bequest, Washington, D. C.:

Common emu	1	American flamingo	1
Brown pelican	1	Sacred ibis	1
European pelican	2	Wood duck	3
Rose-colored pelican	1	Egyptian goose	2
American egret	1	Formosan teal	1
Roseate spoonbill	1	Mallard duck	11
White ibis	2	White-fronted goose	2
Scarlet ibis	1	Brant	1
Boat-billed heron	1	Canada goose	1
Black-crowned night heron	1	Hutchins goose	1

Bernacle goose	4
Ruddy shelldrake	1
Blue goose	2
Snow goose	1
Coscoroba goose	1
Mute swan	1
Tree duck	1
White-faced tree duck	1
Bar-headed goose	2
Baldpate or widgeon	1
Yellow-billed teal	2
Redhead	2
Canvasback	1
Blue-wing teal	1
Red-breasted goose	1
Shelldrake	1
Ducks (not identified)	2
Spurwing goose	1
Call duck	1
Vulturine guineafowl	1
Lady Amherst's pheasant	5
Golden pheasant	3
Panama curassow	1
Brown-eared pheasant	2
Chinese silver pheasant	22
Swinhoe's pheasant	5
Himalayan Impeyan pheasant	1
Malay fireback pheasant	1
Wild turkey	5
Razor-billed curassow	1
Chachalaca	3
Blue Indian peafowl	1
Ring-necked pheasant	17
Green Japanese pheasant	3
Crested jungle quail	1
Reeve's pheasant	3
Domestic turkey	3
Junglefowl	1
Demoiselle crane	2
Crowned crane	2
Cariama	1
Saras crane	2
Siberian crane	1
Lesser adjutant	1
New Zealand mud hen	2
Stanley or paradise crane	1
Ruff	1
Nicobar pigeon	2
Sclater's crowned pigeon	4
Victoria crowned pigeon	1
Common turtle dove	1
Pigeon	13
Donaldson's turacou	1
Hyacinthine macaw	1
Australian king parrot	1
Illiger's macaw	2
Red, blue, and yellow macaw	1
Mexican green macaw	1
Yellow paroquet	2
Long-tailed paroquet	1
Nepalese paroquet	1
Spix's macaw	1
Hawk-headed parrot	1
Blue-cheeked lory	2
Red-headed parrot	1
Blue-eared lory	2
Cockateel	2
Common lory	2
Kea	1
Beautiful lory	1
Regents parrot	1
Blue-winged conure	2
Forstens paroquet	1
Green-naped lory	2
Ariel toucan	1
King bird of paradise	1
Old World raven	1
12-wired bird of paradise	1
Red kangaroo	1
White-crowned guenon	2
Mustache monkey	1
DeBrassa's guenon	1
Mona monkey	1
Macaque	1
Talapoin monkey	1
American beaver	3
Spring buck	1
Indian antelope or black buck	2
Axis deer	2
White-tailed gnu	2
White fallow deer	4
Chapman's zebra	3
Tahr	1
Mouflon	1
East African bush pig	2
Eland	9

Dr. H. E. Ewing, Washington, D. C., tarantula.
T. N. Fielder, Washington, D. C., alligator.
Miss Phoebe B. Fleming, Washington, D. C., Santo Domingo parrot.

W. H. Florence, Clarendon, Va., tarantula.
Miss Edith R. Force, Tulsa, Okla., 6 green snakes, 2 garter snakes.
Marion Foresman, Tulsa, Okla., blue racer.
Franklin Zoological Park, Boston, Mass., Jamaican iguana.
Mrs. R. C. Frink, Hyattsville, Md., alligator.
Carlos P. Fweninger, Washington, D. C., alligator.
H. J. Gibson, Washington, D. C., black snake.
Miss Martha Glenn, Washington, D. C., alligator.
W. Grange, Tucson, Ariz., 7 green toads.
Charles A. Graves, Washington, D. C., black snake.
David H. Greene, Tulsa, Okla., king snake.
Louis Guilini, Washington, D. C., tree frog.
Hagenbeck Bros., Stellingen, Germany, 9 assorted European snakes.
Senator Frederick Hale, Maine, 3 Kodiak bears.
Jesse Hand, Belleplains, N. J., pinesnake.
A. H. Hardisty, Washington, D. C., 4 green frogs, water snake, 3 dusky salamanders, 6 red salamanders.
Verna and John Hazzard, Washington, D. C., prairie dog.
T. S. Hess, Washington, D. C. fence lizard.
Mrs. W. F. Hirst, Takoma Park, Md., opossum.
W. B. Hitt, Washington, D. C., alligator.
George E. Holman, Salt Lake City, Utah, through the United States Biological Survey, cinnamon bear.
Miss Suzanne Holt, Washington, D. C., alligator.
President Herbert Hoover, The White House, red-shouldered hawk.
Miss Mary K. Hoover, Washington, D. C., alligator.
Lieut. Edward T. Hughes, Washington, D. C., white rabbit.
R. H. Hutchison, Glenolden, Pa., 4 Florida diamond-back rattlesnakes, Texas rattlesnake, copperhead, water moccasin.
James Hyslop, Silver Spring, Md., 2 mole snakes.
Roy Jennier, Alexandria, Va., hog-nosed snake.
Mrs. Luther Johnson, Washington, D. C., grass paroquet.
Wheeler Johnson, Washington, D. C., alligator.
Ellis S. Joseph, New York, N. Y., 2 green-flanked caiques.
T. C. King, Takoma Park, Md., barred owl.
W. A. King, Brownsville, Tex., fer-de-lance.
Mrs. Phoebe Knappen, Washington, D. C., box tortoise.
F. H. Knight, Washington, D. C., marine turtle.
R. S. Koffman, Washington, D. C., great horned owl.
Samuel Kress, Costa Rica, through United Fruit Co., 2 deer, emperor boa.
Miss Ellen LaMotte, Washington, D. C., hawk-headed parrot.
Lansburg Bros., boys' department, alligator.
Major Larsen, United States Marine Corps, Quantico, Va., red, yellow, and blue macaw.
Edward Layton, Florence, S. C., 3 alligators.
Commander Leechel, United States Navy, Washington, D. C., turtle.
B. A. Levitan, Washington, D. C., alligator.
Ardale Martz, Madison, Va., barn owl.
Marine Corps, Qauntico, Va., through Maj. K. I. Buse, cinnamon bear.
Judge Robert E. Mattingly, Washington, D. C., 2 Florida diamond-back rattlesnakes.
J. T. McBurney, Chevy Chase, Md., opossum.

Henry J. McDermott, Takoma Park, Md., 8 bats.
E. A. McIlhenny, Avery Island, La., 11 pintail ducks, 1 hybrid duck, 10 blue-winged teals, 2 lesser scaups.
E. B. McLean, Washington, D. C., great red-crested cockatoo.
Mrs. F. McManamy, Washington, D. C., screech owl.
F. A. Meatyard, Washington, D. C., Tovi paroquet.
E. G. Meyer, Washington, D. C., raccoon.
Kenneth Meyers, Tacoma Park, Md., common lizard, 5 common frogs, 2 water snakes.
Michigan Department of Conservation, game branch, 2 beavers.
Miss Dorothy Miller, Washington, D. C., alligator.
Dr. G. S. Miller, Washington, D. C., 3 Jamaican tree snails.
W. W. Minear, Quincy, Ill., 14 banded rattlesnakes, blacksnake, ribbon snake, water snake.
Robert B. Montgomery, Washington, D. C., grivet monkey.
Dewey Moore, Indio, Calif., through Bureau of Plant Industry, 9 giant hairy scorpions, 7 sidewinder rattlesnakes, 4 desert rattlesnakes, 2 California spotted lizards, horned lizard, Agassiz's tortoise, California bullsnake, spiny-swift, 4 lizards.
Mr. Morefield, Amelia, Va., owl.
W. C. Morin, Petersburg, Va., 2 alligators.
W. C. Morrill, Washington, D. C., crow.
John Marshall Newton, Washington, D. C., alligator.
Dr. G. K. Noble, New York, N. Y., 3 eyed lizards, chicken snake, 2 pilot snakes.
Robert and James Nye, Washington, D. C., hermit crab, alligator.
Miss Ott, Washington, D. C., barred owl.
Dr. S. L. Owens, Washington, D. C., screech owl.
Dr. Parker, Heyeres, France, green lizard.
James Parmelee, Washington, D. C., silver pheasant.
F. M. Pearson, Baltimore, Md., horned lizard.
S. F. Perkins, Washington, D. C., 7 ribbon snakes, 42 spotted turtles, 5 black-snakes, garter snake, 7 water snakes, stone snake. Valeria snake.
Philadelphia Zoological Park, Philadelphia, Pa., Matamata turtle, Muhlenberg's turtle.
Hon. Gifford Pinchot, Washington, D. C., 5 Galapagos Island tortoises.
Mr. Polock, Skyland, Va., milk snake.
Prichards Flower Store, Washington, D. C., banded rattlesnake.
Harry Prichard, Washington, D. C., small snake.
Miss Lillian Radionoff, Washington, D. C., 2 canaries,
Carl Rao, Washington, D. C., scorpion.
Mrs. J. A. Raum, Washington, D. C., barred owl.
Wm. Richards, Washington, D. C., barred owl.
H. C. Ritenour, Thurmont, Md., 2 fox snakes.
Dr. George B. Roth, Washington, D. C., 15 painted turtles.
Miss Mary Ruden, Washington, D. C., marmosette.
Paul Ruthling, Sante Fe., N. Mex., red racer.
Wm. K. Ryan, Washington, D. C., 2 blue-bellied lories, 2 angel fish, sulphur crested cockatoo, crested starling, 2 blue honey creepers.
C. O. Samuelson, Virginia Highlands, Va., margaycat.
San Diego Zoological Park, San Diego, California, 3 San Diegan gopher snakes, 3 California boas, 2 California king snakes, 4 Boyle's king snakes, Pacific rattlesnake, 2 desert rattlesnakes, 3 western bull snakes, 3 red rattlesnakes, 2 sidewinder rattlesnakes, tricolor ground snake, 2 green toads, *Crotalus*

confluentus oreganus, Crotalus confluentus mitchellii, Masticophis lateralis, Masticophis flagellum frenatus, Gerrhonotus scincicauda webbii, Sceloporus magister, Phrynosoma platyrhinos, Phrynosoma m'callii.

F. C. Scheppach, Washington, D. C., woodchuck.
Edward S. Schmid, Washington, D. C., black snake.
Mrs. Jouett Shouse, Washington, D. C., alligator.
Edward Skinner, Takoma Park, D. C., banded rattlesnake.
G. T. Smallwood, Washington, D. C., marine turtle.
Capt. W. Bedell Smith, U. S. A., Luzon, Philippine Islands, 3 Javan macaques, 2 Japanese monkeys.
Mrs. W. Bedell Smith, Luzon, Philippine Islands, Palawan peacock-pheasant.
Don Spangenberg, White Mills, Pa., barred owl.
Miss Louise Spencer, Ashland, Pa., smooth greensnake.
H. V. Stabler, Chevy Chase, Md., barred owl.
St. Louis Zoological Park, St. Louis, Mo., alligator, snapping turtle.
Harry Stokes, through United States Biological Survey, Grants Pass., Oreg., puma.
J. R. Sweeny, Washington, D. C., 3 alligators.
Capt. Edward Sykes, Washington, D. C., 2 golden-tailed parrots.
Dr. W. P. Taylor, through United States Biological Survey, Tucson, Ariz., worm snake.
Tela Serpentarium, Tela, Honduras, 2 neotropical rattlesnakes, 4 fer-de-lance, 10 iguanas, spiny-tailed black iguana, indigo snake, Rossignon's snapping turtle, tropical king or false coral snake, 2 coral snakes, Guatemalan terrapin, Mexican moccasin, green tree snake, 2 pike-headed tree snakes, green basilisk, banded basilisk.
Henry and John Thies, Beltsville, Md., red-tailed hawk.
R. E. Thomas, Washington, D. C. alligator.
Miss Mary Tillman, Washington, D. C., ortolan.
Dr. A. C. Tollinger, Philadelphia, Pa., yellow-naped parrot.
United States Biological Survey, 2 Virginia deer, 3 prong-horn antelopes, 6 Canada geese.
United States Bureau of Fisheries, 8 diamond-back terrapins.
University of Michigan, Ann Arbor, Mich., through Mrs. Helen T. Gaige, Department of Zoology, 12 Blanding's turtles.
Mrs. V. M. Van Every, Clarendon, Va., gray squirrel.
Mrs. V. C. Vance, Washington, D. C., canary.
W. M. Wales, Washington, D. C., alligator.
R. A. Walton, Monteverde, Fla., osceola, snapping turtle.
War Department, The General Staff, alligator.
F. A. Ward, Washington, D. C., alligator.
Mrs. Peter C. Warwick, Richmond, Va., capuchin monkey.
Dr. A. Wetmore and F. C. Lincoln, 7 Beata curl-tail lizards, 4 Abbott's swift.
J. H. Willhite, through United States Biological Survey, hybrid wolf.
H. P. Williams, through United States Biological Survey, 8 timber wolves.
Dr. E. C. Wilson, Washington, D. C., great horned owl.
B. Wright, Ashland, Va., opossum.
J. R., jr., and Howard E. Wulsin, Washington, D. C., 3 alligators.
Dr. James Zetek, Ancon, Canal Zone, 2 emperor boas.
Donors unknown, nighthawk, alligator.

Births.—There were 60 mammals born and 14 birds hatched in the park during the year. These include the following:

MAMMALS

Æpyprymnus rufescens	Rat kangaroo	1
Ammotragus lervia	Aoudad	2
Axis axis	Axis deer	1
Bison bison	American bison	2
Canis latrans	Coyote	2
Canis nubilus	Plains wolf	11
Capra ibex	Ibex	1
Cervus elaphus	Red deer	5
Connochaetes taurinus albojubatus	White-bearded gnu	1
Dama dama	Fallow deer	1
Dasyprocta agouti	Common agouti	1
Dasyprocta punctata	Speckled agouti	2
Dasyprocta rubrata	Trinidad agouti	1
Felis leo	Lion	10
Felis pardus suahelicus	East African leopard	2
Hylobates leucogenys	White-cheeked gibbon	1
Lama glama	Llama	2
Nasua narica	Coatimundi	4
Odocoileus costaricensis	Costa Rican deer	1
Ovis canadensis	Rocky Mountain sheep	1
Ovis europaeus	Mouflon	1
Phacochoerus aethiopicus	Wart hog	4
Sika nippon	Japanese deer	3

BIRDS

Anas domestica	Pekin duck	3
Branta canadensis	Canada goose	7
Pica pica hudsonia	American magpie	4

Many species of reptiles deposited eggs since being moved into their new quarters in the reptile house, and a few hatched after June 30, but there were no natural increases in the stock during the year.

Early Easter morning an African python laid about two dozen eggs and incubated them for a period of two months. Unfortunately, however, they proved to be infertile. This was of considerable scientific as well as popular interest.

Purchases and exchanges.—The principal purchases this year have been a male black African rhinoceros, a specimen of the rare babirussa, a pair of raccoon dogs, a Bornean gray gibbon, a Siamang gibbon, and a white-handed gibbon. The last three were purchased under the Walter P. Chrysler fund. At the time these animals were acquired the Zoo had a pair of white-cheeked gibbons and their young, which gave us a total of 4 species of gibbons on exhibition at one time.

The rhinoceros has apparently adapted himself to our conditions and has made a splendid growth.

A quantity of reptiles were purchased for the opening of the new building. Chief among these is a magnificent king cobra, measuring 14 feet 6 inches in length. This was secured six months before we had quarters for it, but Dr. Raymond L. Ditmars, of the New York Zoological Park, very kindly took care of it during this time and then brought it down personally.

A number of small exchanges have been made, but the most interesting was that of a polar bear which was received from the Zoological Park of Edinburgh. This is a male which has been placed with Marian, a young female of the same species.

REMOVALS

Causes of death.—When it has been thought that determination of the cause of death of certain animals might be useful, the specimens have been submitted to the pathological division of the Bureau of Animal Industry for examination. The following list shows the results of the autopsies:

MAMMALS

Artiodactyla: Obstruction in the oesophagus, 1; odema of the heart and pericardium, 1; chronic pneumonia, 1; liver spotted with tubercules, indications of tuberculosis, 1.
Carnivora: Gastro-enteritis, 1; multiple body abscesses, 1; enteritis, 1.
Primates: Gastritis and ulcerated pyloric knob, 1.

BIRDS

Ciconiiformes: Enteritis, 1.
Pelecaniformes: Internal hemorrhage, 1.
Psittaciformes: Tuberculosis, 1.

ANIMALS IN THE COLLECTION JUNE 30, 1931

Mammals

MARSUPIALIA

Æpyprymnus rufescens	Rat kangaroo	3
Didelphis virginiana	Opossum	9
Macropus robustus	Wallaroo or euro kangaroo	1
Macropus rufus	Great red kangaroo	2
Phascolomys mitchelli	Wombat	1

CARNIVORA

Acinonyx jubatus	Cheeta	1
Arctictis binturong	Binturong or bear cat	1
Bassariscus astutus	Cacomixtle or ring tail	2
Canis dingo	Dingo	1
Canis latrans	Coyote	10
	Albino coyote	1
Canis mesomelas	Black-backed jackal	1

Canis nubilus	Wolf	18
Canis nubilus domesticus	Wolf+dog hybrid	1
Crocuta crocuta germinans	East African spotted hyena	1
Euarctos americanus	American black bear	3
	Cinnamon bear	4
Euarctos emmonsii	Glacier bear	1
Felis capensis hindei	East African serval	2
Felis concolor azteca	Mexican puma	2
Felis concolor oregonensis	Puma	1
Felis leo	Lion	10
Felis onca	Jaguar	2
	Black jaguar	1
Felis pardalis	Ocelot	1
Felis pardalis brasiliensis	Brazilian ocelot	1
Felis pardalis var	Ocelot	1
Felis pardus	Black leopard	1
Felis pardus suahelicus	East African leopard	6
Felis serval	Serval	1
Felis tigris	Bengal tiger	1
Felis tigris longipilis	Manchurian tiger	1
Genetta dongalana neumanni	Neumann's genet	2
Gulo luscus	Wolverine	1
Helarctos malayanus	Sun bear	2
Herpestes ichneumon	Egyptian mongoose	1
Hyaena brunnea	Brown hyena	2
Lutra canadensis vaga	Florida otter	1
Lynx baileyi	Bailey's lynx	1
Lynx caracal	Caracal	1
Lynx rufus	Bay lynx	2
Mellivora capensis	Ratel	1
Mephitis nigra	Skunk	2
Mustela furo	Ferret	1
Nasua narica	Gray coatimundi	8
Nasua sp	Coatimundi	1
Nasua sp	Brazilian coatimundi	1
Nyctereutes procyonoides	Raccoon dog	3
Paradoxurus philippensis	Philippine palm civet	5
Potos flavus	Kinkajou	4
Procyon cancrivorus	Crab-eating raccoon	2
Procyon lotor	Raccoon	23
Proteles cristatus	Aard-wolf	1
Taxidea taxus	American badger	2
Tayra barbara	Tayra	1
Thalarctos maritimus	Polar bear	4
Urocyon cinereoargenteus	Gray fox	2
Urocyon sp	Gray fox	1
Ursus apache	Apache grizzly	1
Ursus arctos	European brown bear	6
Ursus gyas	Alaska Peninsula brown bear	4
Ursus horribilis	Grizzly bear	1
Ursus kidderi	Kidder's bear	2
Ursus middendorffi	Kodiak bear	5
Ursus sitkensis	Sitka brown bear	3

Ursus thibetanus	Himalayan bear	2
Viverra civetta	Civet	1
Viverra tangalunga	Tangalunga	1
Vulpes fulva	Red fox	4
	Silver fox	1

PINNIPEDIA

Callorhinus alascanus	Northern fur seal	2
Phoca richardi	Pacific harbor seal	3
Zalophus californianus	California sea lion	3

PRIMATES

Aotus trivirgatus	Douroucouli	1
Ateles geoffroyi	Gray spider monkey	2
Ateles sp	Spider monkey	1
Callithrix jacchus	Marmosette	1
Cebus capucinus	White-throated capuchin	4
Cebus unicolor	Gray or grizzled capuchin	3
Cercocebus fuliginosus	Sooty mangabey	4
Cercopithecus albigularis	Sykes's or blue monkey	4
Cercopithecus brazzae	De Brazza's guenon	1
Cercopithecus callitrichus	Green guenon	2
Cercopithecus cephus	Mustache monkey	1
Cercopithecus griseoviridis	Grivet monkey	4
Cercopithecus l'hoesti	Killimbira guenon	1
Cercopithecus mona	Mona monkey	4
Cercopithecus petaurista	Lesser white-nosed guenon	2
Cercopithecus petronellae	White-crowned guenon	1
Cercopithecus pygerythra	Vervet	1
Cercopithecus roloway	Roloway monkey	1
Gorilla gorilla	Gorilla	1
Hylobates leucogenys	White-cheeked gibbon	2
Lemur rufifrons	Red-fronted lemur	1
Leontocebus rosalia	Silky or lion-headed marmosette	2
Macaca andamanensis	Burmese macaque	1
Macaca fuscata	Japanese monkey	5
Macaca irus	Crab-eating macaque	2
Macaca mordax	Javan macaque	2
Macaca mulatta	Rhesus monkey	5
Macaca nemestrina	Pig-tailed monkey	1
Macaca speciosa	Red-faced monkey	1
Macaca syrichta	Philippine monkey	3
Magus maurus	Moor monkey	2
Mandrillus leucophæus	Drill	1
Mandrillus sphinx	Mandrill	3
Miopithecus talapoin	Talapoin monkey	1
Pan satyrus	Chimpanzee	2
Papio anubis	Anubis or yellow baboon	1
Papio hamadryas	Hamadryas baboon	1
Papio neumanni	Olive baboon	1
Papio porcarius	Chacma	2
Simia sylvanus	Barbary ape	1

RODENTIA

Acanthion brachyurum	Malay porcupine	2
Castor canadensis	American beaver	5
Cavia porcellus	Domestic guinea pig	25
Citellus tridecemlineatus	Thirteen-lined ground squirrel	2
Cuniculus paca virgatus	Central American paca	4
Cynomys ludovicianus	Prairie dog	6
Dasyprocta punctata	Speckled agouti	2
Dasyprocta rubrata	Trinidad agouti	4
Dolichotis patagonica	Patagonian cavy	2
Dolichotis salinicola	Dwarf cavy	2
Erethizon dorsatum	Eastern porcupine	1
Glaucomys volans	Flying squirrel	3
Hydrochœrus hydrochœrus	Capybara	1
Hystrix africæaustralis	African porcupine	3
Lagostomus trichodactylus	Viscacha	2
Marmota monax	Woodchuck	1
Sciurus carolinensis	Gray squirrel	1
	Albino gray squirrel	2
Sciurus niger	Fox squirrel	1

LAGOMORPHA

Oryctolagus cuniculus	Domestic rabbit	5

ARTIODACTYLA

Æpyceros melampus suara	East African impalla	2
Ammotragus lervia	Aoudad or Barbary sheep	5
Anoa depressicornis	Anoa	1
Antilocapra americana	Prong-horn antelope	3
Antilope cervicapra	Black buck or Indian antelope	3
Axis axis	Axis deer	5
Babirussa alfurus	Babirussa	1
Bison bison	American bison or buffalo	11
Bos indicus	Zebu	1
Boselaphus tragocamelus	Nilgai	2
Bubalus bubalis	Indian buffalo	3
Camelus bactrianus	Bactrian camel	1
Capra hircus	Goat	3
Capra ibex	Alpine ibex	2
Cervus canadensis	American elk or wapiti	5
Cervus elaphus	Red deer	12
Cervus hanglu	Kashmir deer	1
Cervus xanthopygus	Bedford deer	5
Connochætes gnu	White-tailed gnu	2
Connochætes taurinus	Brindled gnu	1
Connochætes taurinus albojubatus	White-bearded gnu	2
Dama dama	Fallow deer	12
	Fallow deer (white)	8
Hemitragus jemlahicus	Tahr	6
Hyelaphus porcinus	Hog deer	3
Lama glama	Llama	8

Lama huanacus	Guanaco	2
Odocoileus columbianus sitkensis	Sitka deer	1
Odocoileus costaricensis	Costa Rican deer	1
Odocoileus hemionus	Mule deer	2
Odocoileus virginianus	Virginia deer	4
Oreamnos americanus	Mountain goat	2
Ovibos moschatus wardi	White-faced musk ox	2
Ovis canadensis	Rocky Mountain sheep	7
Ovis europaeus	Mouflon	7
Pecari angulatus	Peccary	1
Phacochœrus æthiopicus massaicus	East African warthog	3
Poephagus grunniens	Yak	7
Potamochœrus chœropotamus	East African bush pig	2
Rangifer tarandus	Reindeer	3
Rucervus duvaucelii	Barasingha	7
Rucervus eldii	Burmese deer	1
Rusa moluccensis	Molucca deer	1
Sika nippon	Japanese deer	14
Strepsiceros strepsiceros	Greater kudu	1
Sus scrofa	European wild boar	2
Synceros caffer	South African buffalo	1
Tragelaphus angasi	Inyala	1
Taurotragus oryx	Eland	3

PERISSODACTYLA

Chœropsis liberiensis	Pigmy hippopotamus	2
Equus grevyi-asinus	Zebra-ass hybrid	1
Equus grevyi-caballus	Zebra-horse hybrid	1
Equus onager	Asiatic wild ass or kiang	1
Equus przewalskii	Mongolian wild horse	3
Equus quagga chapmani	Chapman's zebra	5
Equus zebra	Mountain zebra	2
Hippopotamus amphibius	Hippopotamus	1
Rhinoceros bicornis	Black rhinoceros	1
Tapirella bairdii	Baird's tapir	1
Tapirus terrestris	Brazilian tapir	1

PROBOSCIDEA

Elephas sumatranus	Sumatra elephant	1
Loxodonta africana oxyotis	African elephant	1

EDENTATA

Dasypus novemcinctus	9-banded armadillo	1

Birds

RATITAE

Casuarius unipendiculatus	Single wattled cassowary	2
Dromiceius novaehollandiae	Common emu	3
Rhea americana	Common rhea or nandu	1
Struthio australis	South African ostrich	3
Struthio camelus	Nubian ostrich	1

PELECANIFORMES

Anhinga anhinga	Anhinga or snake bird	1
Pelecanus californicus	California brown pelican	4
Pelecanus conspicillatus	Australian pelican	1
Pelecanus erythrorhynchos	American white pelican	10
Pelecanus occidentalis	Brown pelican	4
Pelecanus onacrotalus	European pelican	4
Pelecanus roseus	Rose-colored pelican	2
Phalacrocorax auritus floridanus	Florida cormorant	1

CICONIIFORMES

Ajaja ajaja	Roseate spoonbill	2
Ardea goliath	Goliath heron	2
Ardea herodias	Great blue heron	3
Ardea occidentalis	Great white heron	1
Balaeniceps rex	Shoebill stork	1
Cochlearius cochlearius	Boatbill	3
Ephippiorhynchus senegalensis	Saddle-billed stork	1
Guara alba	White ibis	9
Guara rubra	Scarlet ibis	3
Heroidias egretta	American egret	1
Leptoptilus crumeniferus	Maribou	1
Leptoptilus dubius	Indian adjutant	1
Leptoptilus javanicus	Lesser adjutant	2
Mycteria americana	Wood ibis	1
Nycticorax nycticorax naevius	Black-crowned night heron	30
Phoenicopterus ruber	American flamingo	11
Threskiornis aethippicus	Sacred ibis	3
Threskiornis melanocephalus	Black-headed ibis	2

ANSERIFORMES

Aix sponsa	Wood duck	1
Alopochen aegyptiacus	Egyptian goose	3
Alopochen jubatus	Orinoco goose	1
Anas domestica	Peking duck	3
Anas platyrhynchos	Mallard	34
Anas rubripes	Black or dusty mallard	2
Anas undulata	African yellow-billed duck	2
Anser albifrons	White-fronted goose	4
Anser brachyrhynchus	Pink-footed goose	1
Anser cinereus domestica	Toulouse goose	2
Anser fabalis	Bean goose	2
Branta bernicla glaucogastra	Brant	6
Branta canadensis	Canada goose	22
Branta canadensis hutchinsii	Hutchins's goose	1
Branta canadensis minima	Cackling goose	2
Branta canadensis occidentalis	White-cheeked goose	31
Casarca variegata	Paradise duck	1
Chaulelasmus streperus	Gadwall	2
Chen caerulescens	Blue goose	4
Chenopis atrata	Black swan	3
Coscoroba candida	Coscoroba goose	1

Cygnopsis cygnoides	Chinese goose	1
Cygnus columbianus	Whistling swan	3
Cygnus gibbus	Mute swan	2
Dafila acuta	Pintail	6
Dafila bahamensis	Bahama pintail	2
Dendrocygna arborea	West Indian tree duck	4
Dendrocygna autumnalis	Black-bellied tree duck	1
Dendrocygna eytoni	Eyton's tree duck	3
Dendrocygna viduata	White-faced tree duck	1
Eulabia indica	Bar-headed goose	1
Mareca americana	Baldpate	3
Marila americana	Redhead	2
Marila marila	Scaup	1
Marila valisineria	Canvas-back	2
Metopiana peposaca	Rosy-billed pochard	1
Nesochen sandvicensis	Hawaiian goose	1
Nettion carolinense	Green-winged teal	3
Nettion formosum	Baikal teal	4
Philacte canagica	Emperor goose	3
Plectropterus gambensis	Spur-winged goose	4
Querquedula discors	Blue-winged teal	8
Rufibrenta ruficollis	Red-breasted goose	1

FALCONIFORMES

Aegypius monachus	Cinereous vulture	2
Aquila chrysaetos	Golden eagle	3
Buteo borealis	Red-tailed hawk	3
Buteo lineatus	Red-shouldered hawk	1
Buteo platypterus	Broad-winged hawk	3
Cathartes aura	Turkey vulture	3
Coragyps atratus	Black vulture	2
Elanus caeruleus	White kite	1
Falco peregrinus	Peregrine falcon	1
Falco sparverius	Sparrow hawk	2
Gymnogyps californianus	California condor	3
Gyps rueppelli	Ruppell's vulture	2
Haliaeetus leucocephalus	Bald eagle	11
Haliastur indus	Malay Brahminy kite	1
Milvus migrans	Yellow-billed kite	1
Polyborus cheriway	Audubons caracara	4
Pseudogyps africanus	White-headed vulture	1
Sagittarius serpentarius	Secretary bird	1
Sarcoramphus papa	King vulture	1
Terathopius ecaudatus	Bateleur eagle	1
Torgos tracheliotus	African eared vulture	4
Uroaetus audax	Wedge-tailed eagle	2
Vultur gryphus	South American condor	1

GALLIFORMES

Acryllium vulturinum	Vulturine guinea fowl	3
Argusianus argus	Argus pheasant	2
Chrysolophus amherstiae	Lady Amherst's pheasant	5

Chrysolophus pictus	Golden pheasant	3
Colinus virginianus	Bobwhite	1
Coturnix coturnix	Migratory quail	1
Crax globicera	Mexican curassow	2
Crax globulosa	Spixs wattled curassow	2
Crax panamensis	Panama curassow	1
Crossoptilon mantchuricum	Brown-eared pheasant	2
Excalfactoria sinensis	Pigmy quail	2
Gallus sp	Jungle fowl	1
Gennaeus edwardsi	Edward's pheasant	1
Gennaeus nycthemerus	Silver pheasant	13
Gennaeus swinhoei	Swinhoe's pheasant	4
Lophophorus impeyanus	Himalayan Impeyan pheasant	1
Meleagris gallopavo	Wild turkey	3
Mitu mitu	Razor-billed curassow	2
Numida mitrata reichenowi	Reichenow's helmeted guinea fowl	4
Ortalis cinericeps	Gray-headed chachalaca	2
Ortalis leucogastra	White-bellied chachalaca	1
Pavo cristatus	Peafowl	9
	White peafowl	2
Penelope boliviana	Crested guan	2
Phasianus torquatus	Ring-necked pheasant	20
Phasianus versicolor	Green Japanese pheasant	2
Polyplectron napoleonis	Palawan peacock-pheasant	1
Rollulus roulroul	Crested jungle quail	1
Syrmaticus reevesi	Reeve's pheasant	2

GRUIFORMES

Anthropoides virgo	Demoiselle crane	5
Antigone australasiana	Australian crane	2
Balearica gibbiriceps	East African crowned crane	5
Balearica pavonina pavonina	West African crowned crane	2
Cariama cristata	Cariama	1
Dissura episcopus	Woolly-necked stork	1
Eurypyga helias	Sun bittern	1
Fulica americana	Coot	3
Fulica cristata	Knobbed coot	2
Grus antigone	Saras crane	2
Grus canadensis	Little brown crane	1
Grus cinerea	Gray crane	2
Grus leucauchen	White-naped crane	1
Grus leucogeranus	Siberian crane	2
Grus mexicana	Sandhill crane	1
Hypotaenidia philippensis	Lesser rail	1
Megalornis lilfordi	Lilford's crane	1
Microtribonyx ventralis	Black-tailed moor hen	1
Ocydromus australis	South Island weka rail	1
Porphyrio melanotus	New Zealand mud hen	4
Psophia crepitans	Trumpeter	2
Psophia viridis	Green-backed trumpeter	2
Rhynochetos jubatus	Kagu	1

CHARADRIIFORMES

Larus argentatus	Herring gull	5
Larus californicus	California gull	7
Larus novaehollandiae	Silver gull	53
Larus occidentalis	Western gull	6
Œdicnemus bistriatus vocifer	South American stone plover	1
Philomachus pugnax	Ruff	4
Sterna caspia	Caspian tern	2

COLUMBIFORMES

Caloenas nicobarica	Nicobar pigeon	7
Chalcophaps indica	Green-winged dove	1
Columba sp	Doves	2
Columba guinea	Speckled pigeon	3
Columba palumbus	Wood pigeon	3
Gallicolumba luzonica	Bleeding-heart dove	2
Globicera pacifica	Pacific pigeon	1
Goura sclateri	Sclater's crowned pigeon	4
Goura victoria	Victoria crowned pigeon	2
Janthoenas vitiensis	White-throated fruit pigeon	1
Macropygia doreya	New Guinea brown pigeon	1
Oena capensis	Cape dove	1
Streptopelia risoria	Ring-neck dove	2
Streptopelia senegalensis	East African ring-neck dove	5
Turtur risoria	Turtle dove	4
Zenaidura macroura	Mourning dove	7
Zenaidura macroura macroura	West Indian dove	1

CUCULIFORMES

Eudynamis honorata	Indian koel	1
Turacus donaldsoni	Donaldson's turacou	1

PSITTACIFORMES

Agapornis fischeri	Fischer's love bird	2
Agapornis lilianae	Nyassa love bird	5
Agapornis madagascariensis	Gray-headed love bird	1
Agapornis personata	Yellow-collared love bird	1
Agapornis pullaria	Red-faced love bird	2
Agapornis taranta	Abyssinian love bird	3
Amazona sp	——— parrot	1
Amazona aestiva	Blue-fronted parrot	1
Amazona albifrons	White-fronted parrot	6
Amazona albifrons nana	Lesser white-fronted parrot	2
Amazona amazonica	Orange-winged parrot	3
Amazona arausiaca	Bouquet's parrot	1
Amazona auropalliata	Yellow-naped parrot	3
Amazona farinosa	Mealy parrot	1
Amazona festiva	Festive parrot	1
Amazona leucocephala	Cuban parrot	6
Amazona ochrocephala	Yellow-fronted parrot	8

Amazona ochroptera	Yellow-shouldered parrot	1
Amazona oratrix	Double yellow-head parrot	8
Amazona ventralis	Santo Domingo parrot	3
Amazona viridigenalis	Red-crowned parrot	4
Anodorhynchus hyacinthinus	Hyacinthine macaw	2
Aprosmictus cyanopyzicus	Australian king parrot	1
Aprosmictus erythropterus	Crimson-winged paroquet	1
Ara ararauna	Yellow and blue macaw	7
Ara macao	Red, blue, and yellow macaw	6
Ara maracana	Illiger's macaw	3
Ara mexicana	Mexican green macaw	3
Ara severa	Severe macaw	1
Aratinga rubritorquis	Red-throated conure	1
Aratinga solstitialis	Yellow paroquet	2
Brotogeris jugularis	Tovi paroquet	1
Conurus longicauda	Long-tailed paroquet	3
Conurus nepalensis	Nepalese paroquet	2
Coracopsis nigra	Lesser vasa parrot	1
Coracopsis vasa	Greater vasa parrot	1
Cyanopsittacus spixi	Spix's macaw	3
Deroptyus accipitrinus	Hawk-headed parrot	3
Eclectus pectoralis	Red-headed parrot	1
Eos reticulata	Blue-eared lory	2
Eos rubra	Red lory	1
Eos variegata	Purple lory	1
Eupsittula aurea	Golden-crowned paroquet	2
Eupsittula canicularis	Petz's paroquet	2
Eupsittula jendaya	Jenday paroquet	1
Eupsittula weddellii	Weddell's paroquet	2
Kakatoe alba	White cockatoo	1
Kakatoe galerita	Sulphur-crested cockatoo	2
Kakatoe gymnopis	Bare-eyed cockatoo	1
Kakatoe leadbeateri	Leadbeater's cockatoo	2
Kakatoe moluccensis	Great red-crested cockatoo	2
Kakatoe roseicapilla	Roseate cockatoo	8
Leptolophus novaehollandicus	Cockateel	3
Lorius domicella	Ceram lory	1
Lorius lory	Common lory	1
Melopsittacus undulatus	Grass paroquet	4
Microglossus aterrimus	Great black cockatoo	1
Myopsittacus monachus	Quaker paroquet	2
Nandayus nanday	Nanday paroquet	1
Nestor notabilis	Kea	5
Pionites leucogaster	Green-flanked caique	2
Pionus maximiliani	Maximilian's parrot	1
Pionus menstruus	Blue-headed parrot	2
Pionites xanthomera	Amazonian caique	3
Platycercus elegans	Beautiful lory	1
Platycercus eximius	Rosella paroquet	1
Poicephalus meyeri matschiei	East African parrot	2
Polytelis anthopeplus	Regent's parrot	1
Psephotus haematorrhous	Blue-bonnet paroquet	1
Psittacula guianensis	Green-rumped parrotlet	1

Pyrrhura picta	Blue-winged conure	3
Tanygnathus megalorhynchus	Great-billed paroquet	1
Trichoglossus cyanogrammus	Green-naped lorikeet	4
Trichoglossus forsteni	Forsten's paroquet	4
Trichoglossus novaehollandae	Blue-bellied lory	1
Urochroma surda	Golden-tailed parrot	2

STRIGIFORMES

Bubo bubo	European eagle owl	1
Bubo virginianus	Great horned owl	10
Nyctea nyctea	Snowy owl	1
Otus asio	Screech owl	5
Pulsatrix perspicillata	Spectacled owl	2
Strix varia	Barred owl	12
Tyto alba pratincola	American barn owl	4

CAPRIMULGIFORMES

Chordeiles virginianus	Nighthawks	3

COLIIFORMES

Colius macrurous	Mouse bird or coly	1

CORACIIFORMES

Anthracoceros malayanus	White-browed hornbill	1
Lophoceros jacksoni	Jackson's hornbill	1

PICIFORMES

Ramphastos ariel	Ariel toucan	2
Ramphastos carinatus	Sulphur-breasted toucan	2
Ramphastos culminatus	White-breasted toucan	1
Trachyphonus emini	Emin Pasha's barbet	1

PASSERIFORMES

Acridotheres tristis	Common mynah	1
Aethiopsar cristatellus	Crested mynah	1
Agelaius icterocephalus	Yellow-headed marsh bird	1
Aidemosyne cantans	Tawny waxbill	2
Amadina fasciata	Cut-throat finch	9
Amandava amandava	Strawberry finch	15
Amblyrhamphus holosericeus	Red-headed marsh troupial	1
Ampelis cedrorum	Cedar wax-wing	1
Calocitta formosa	Mexican magpie jay	2
Carduelis carduelis	European goldfinch	2
Chasmorhynchus nudicollis	Naked-throated bell bird	1
Chloris chloris	Greenfinch	1
Cicinnurus regius	King bird of paradise	2
Cissilopha yucatanica	Yucatan jay	1
Corvultur albicollis	White-necked raven	1
Corvus albus	White-breasted crow	2
Corvus brachyrhynchos	American crow	5

Corvus corax sinuatus	American raven	5
Corvus coronoides	Australian crow	1
Cosmopsarius regius	Splendid starling	4
Cyanerpes cyaneus	Blue honey creeper	2
Cyanocitta stelleri diademata	Long-crested jay	1
Cyanocorax pileatus	Pileated jay	2
Diatropura progne	Giant whydah	1
Eromopteryx leucopareia	Fisher's finch lark	1
Foudia madagascariensis	Madagascar weaver	3
Garrulax pectoralis	Black-gorgeted laughing thrush	1
Gracula javana	Hill mynah	1
Gracula religiosa	Southern hill mynah	2
Gymnomystax melanicterus	Bare-jawed troupial	1
Heteropsar albicapillus	White-capped starling	1
Icterus parisorum	Scott oriole	1
Lamprocolius sycobius	Southern glossy starling	1
Lamprocorax metallicus	New Guinea starling	1
Liothrix luteus	Red-billed hill-tit	1
Melanopteryx rubiginosus	Chestnut weaver	27
Mino dumonti	Golden-headed mynah	1
Molpastes haemorrhous	Black-headed bulbul	1
Munia atricapilla	Black-headed nun	1
Munia castaneithorax	Chestnut-breasted finch	1
Munia oryzivora	Java finch	8
Munia punctulata	Nutmeg finch	18
Otocompsa jocosa	Red-eared bulbul	3
Paradisea rubra	Red bird of paradise	1
Paradisornis rudolphi	Prince Rudloph's blue bird of paradise	1
Paroaria cucullata	Red-crested cardinal	2
Parotia lawesi lawesi	Lawes' six-plumed bird of paradise	1
Pica pica hudsonia	Magpie	2
Ploceus intermedieus	Masked weaver	6
Poephila personata	Masked grass finch	1
Pyromelana orix	Red-crowned bishop bird	2
Quelea sanguinirostris intermedia	Southern masked weaver finch	43
Schlegelia wilsoni	Wilson's bird of paradise	1
Seleucides niger	12-wired bird of paradise	3
Semioptera wallacei	Wallace's bird of paradise	1
Serinus canarius	Canary	11
Sicalis flaveola	Saffron finch	1
Steganura paradisea	Paradise whydah	1
Struthidea cinerea	Australian gray jumper	1
Sturnus vulgaris	Starling	2
Taeniopygia castanotis	Zebra finch	1
Trochalapteron canorum	Brown laughing thrush	1
Urobrachya phoeniceia	Chestnut-winged whydah	1
Urocissa occipitalis	Red-billed blue magpie	3
Vidua macroura	Pintail whydah	2
Xanthoura luxuosa	Green jay	1
Xanthoura luxuosa sub. sp	Nicaragua green jay	1

Reptiles

CHELONIA

Amyda ferox	Soft-shell turtle	3
Chelodina longicollis	Australian long-neck terrapin	4
Chelydra osceola	Florida snapping turtle	1
Chelydra rossignonii	Rossignon's snapping turtle	1
Chelydra serpentina	Snapping turtle	7
Chelys fimbriata	Matamata turtle	1
Chrysemys picta	Painted turtle	8
Clemmys guttata	Spotted turtle	8
Clemmys insculpta	Wood turtle	5
Clemmys marmorata	Western spotted turtle	1
Clemmys muhlenbergii	Muhlenberg's turtle	1
Cuora amboinensis	Common Malayan box-tortoise	2
Deirochelys reticularia	Chicken turtle	1
Emys blandingii	Blanding's turtle	4
Emys orbicularis	European pond turtle	11
Geomyda spengleri	Liu-kiu terrapin	1
Gopherus agassizii	Agassiz's tortoise	1
Gopherus polyphemus	Gopher turtle	4
Hydromedusa tectifera	South American snake-neck turtle	2
Kinosternon flavescens	Texas musk turtle	1
Kinosternon subrubrum	Musk turtle	4
Macrochelys temminckii	Alligator snapping turtle	1
Malaclemys centrata×M. pileata	Diamond-back terrapin (hybrids)	8
Pelomedusa galeata	Common African water tortoise	8
Pelusios heinrothi	Heinroth's turtle	2
Pelusios nigricans	Black water tortoise	1
Pseudemys elegans	Cumberland terrapin	3
Pseudemys floridana	Florida cooter	12
Pseudemys palustris	West Indian turtle	2
Sternotherus odoratus	Musk turtle	2
Terrapene carolina	Box tortoise	32
Terrapene major	Florida box turtle	11
Terrapene ornata	Ornate turtle	4
Testudo calcarata	Abyssinian tortoise	1
Testudo ephippium	Duncan Island tortoise	7
Testudo porteri	Indefatigable Island tortoise	1
Testudo radiata	Radiated tortoise	2
Testudo tabulata	South American tortoise	9
Testudo vicina	Albemarle Island tortoise	2

CROCODILIA

Alligator mississipiensis	Alligator	42
Caiman nigra	Caiman	2
Crocodylus acutus	American crocodile	2
Crocodylus cataphractus	West African crocodile	3
Tomistoma schlegeli	Malayan gavial	3

LACERTILIA

Tarentola mauretanica	Mauretanian gecko	3
Ameiva abbotti	Abbott's swift	5
Amphibolurus barbatus	Bearded lizard	3
Anolis allogus	Cuban anolis	4
Anolis carolinensis	Carolina anolis	7
Anolis equestris	Chameleon anolis	8
Anolis lineatopus	Jamaican anolis	1
Basiliscus vittatus	Banded basilisk	6
Chamaeleon senegalensis	Senegal chameleon	3
Cnemidophorus sexlineatus sacki	Spotted race-runner	2
Cnemidophorus tessellatus tessellatus	Desert whiptail	1
Coleonyx brevis	Coleonyx	1
Conolophus subcristatus	Galapagos iguana	1
Crotaphytus collaris	Collared lizard	9
Ctenosaura acanthura	Spiny-tailed iguana	5
Cyclura	iguana	1
Cyclura cornuta	Rhinoceros iguana	2
Cyclura macleayi	Cuban ground iguana	2
Cyclura nuchalis	Fortune Island iguana	3
Dipso-saurus dorsalis	Spotted lizard	2
Egernia cunninghami	Australian or Cunningham's skink	1
Gerrhonotus scincicauda webbii	Alligator lizard	1
Heloderma horridum	Beaded lizard	2
Heloderma suspectum	Gila monster	6
Hydrosaurus pustulosus	Philippine water-dragon	2
Iguana iguana	Common iguana	12
Lacerta lepida	Ocellated lizard	2
Lacerta lilfordi grossae	Balearic Island lizard	6
Lacerta lilfordi jordansi	Balearic Island lizard	7
Laemanctus alticoronatus	Green basilisk	1
Leiocephalus carinatus	Carinated curl-tail lizard	1
Leiocephalus cubensis	Cuban curl-tail lizard	2
Liocephalus beatanus	Beata curl-tail lizard	3
Ophisaurus ventralis	Glass snake	3
Phrynosoma blainvillii blainvillii	Blainville's horned lizard	1
Phrynosoma cornutum	Horned lizard	9
Phrynosoma platyrhinos	Smooth horned lizard	3
Phrynosoma m'callii	MacCall's horned lizard	1
Physignathus lesueurii	Lesueur's water dragon	1
Sauromalus obesus	Chuckwalla	1
Sceloporus clarkii	Spiny swift	3
Sceloporus undulatus	Common fence lizard	12
Tiliqua nigrolutea	Mottled lizard	1
Tiliqua scincoides	Blue-tongued lizard	3
Trachysaurus rugosus	Stump-tailed lizard	4
Tupinambis nigropunctatus	Tegu lizard	2
Uromastix spinipes	Spiny-tailed lizard	2
Varanus gouldii	Gould's monitor	2
Varanus niloticus	Nile monitor	4

OPHIDIA

Agkistrodon mokasen	Copperhead	9
Agkistrodon piscivorus	Water moccasin	5
Arizona elegans occidentalis	Faded snake	1
Carphophis vermis	Worm snake	1
Cemophora coccinea	Scarlet snake	1
Coluber constrictor constrictor	Black snake	2
Coluber dahlii	Dahls whip snake	2
Coluber hippocrepis	Horseshoe whip snake	3
Coluber jugularis caspius	European whip snake	4
Coluber longissimus	Aesculapian snake	1
Coluber quatuorlineatus	European 4-lined snake	2
Coluber quatuorlineatus sauromates	European 4-lined snake	2
Constrictor constrictor	Boa	3
Constrictor imperator	Central American or emperor boa	3
Crotalus adamanteus	Florida diamond-back rattlesnake	2
Crotalus atrox	Desert diamond-back rattlesnake	6
Crotalus cerastes	Sidewinder rattlesnake	6
Crotalus horridus	Banded rattlesnake	10
Crotalus mitchellii	Bleached rattlesnake	2
Crotalus oreganus	Pacific rattlesnake	2
Crotalus ruber	Red rattlesnake	2
Crotalus terrificus	South American rattlesnake	2
Diadophis punctatus	Ring-necked snake	3
Drymarchon corais cooperi	Indigo snake	8
Elaphe guttata	Corn snake	2
Elaphe laeta	Emory's snake	2
Elaphe obsoleta lindheimeri	Lindheimer's snake	5
Elaphe obsoleta obsoleta	Pilot snake	1
Elaphe quadrivittata	Chicken snake	5
Elaphe rosacea	Key rat snake	1
Elaphe vulpina	Fox snake	2
Epicrates angulifer	Cuban tree boa	4
Eryx johni	Sand boa	1
Eunectes murinus	Anaconda	1
Farancia abacura	Horn snake	2
Heterodon contortrix	Hog-nose snake	1
Lampropeltis californiæ	California king snake	1
Lampropeltis calligaster	Yellow-bellied king snake	1
Lampropeltis getulus getulus	King snake	3
Lampropeltis getulus boylii	Boyle's king snake	1
Lampropeltis rhombomaculata	Mole snake	2
Lampropeltis triangulum	Milk snake	1
Lejosophis gigas	Cobra de Paraguay	2
Leptophis occidentalis	Green tree snake	1
Lichanura roseofusca	California boa	1
Liodytes alleni	Allen's mud snake	1
Loxocemus bicolor	American python	2
Masticophis flagellum flavigularis	Coachwhip snake	9
Masticophis flagellum frenatus	Red racer	1

Masticophis lateralis	California racer	1
Micrurus fulvius	Coral snake	1
Naja hannah	King cobra	1
Natrix fasciata fasciata	Banded water snake	2
Natrix grahamii	Graham's water snake	1
Natrix natrix	European grass snake	3
Natrix	Water snake	24
Natrix	Red water snake	1
Opheodrys aestivus	Rough-scaled green snake	1
Pituophis catenifer annectens	California bullsnake	7
Pituophis sayi	Bullsnake	4
Python molurus	Indian python	3
Python regius	Ball python	3
Python reticulatus	Regal python	2
Python sebae	African python	3
Python variegatus	Carpet python	1
Sistrurus miliarius	Pigmy rattlesnake	1
Sonora occipitalis	Tricolored ground snake	1
Thamnophis sauritus proximus	Western ribbon snake	1
Thamnophis sauritus sauritus	Ribbon snake	3
Thamnophis sirtalis sirtalis	Garter snake	3
Tretanorhinus variabilis	Cuban water snake	2

Amphibians

CAUDATA

Ambystoma mexicanum	Axolotl	2
Amphiuma tridactylum	Congo eel or Congo snake	3
Cryptobranchus alleganiensis	Hellbender	5
Megalobatrachus japonicus	Giant salamander	2
Pleurodeles waltlii	Spanish newt	2
Proteus anguinus	Blind salamander	4
Pseudobranchus striatus	Striped mud eel	2
Salamandra salamandra	European spotted salamander	2
Triturus pyrrhogaster	Red-bellied Japanese newt	3
Triturus viridescens	Common newt	5

SALIENTIA

Alytes obstetricans	Midwife toad	2
Bufo alvarius	Green toad	7
Bufo americanus	Common American toad	2
Bufo fowleri	Fowler's toad	3
Bufo marinus	Marine toad	1
Bufo peltocephalus	Cuban giant toad	5
Bufo terrestris	Southern toad	4
Bufo valliceps	Mexican toad	3
Hyla cinerea	Green tree frog	5
Hyla gratiosa	Florida tree frog	4
Hyla baudinii	Mexican tree frog	1
Hyla septentrionalis	West Indian tree frog	1
Hyla versicolor	Common tree frog	1
Leptodactylus pentadactylus	Dominican giant frog	4
Rana catesbeiana	Bull frog	1

Rana clamitans	Green frog	8
Rana palustris	Common swamp frog	2
Rana sphenocephala	Southern leopard frog	3
Rana esculenta	Edible frog	5
Rana dalmatina	Agile frog	1
Xenopus mulleri	East African smooth-clawed frog	1

Fishes

Aequidens sp	----------	1
Barbus ocellifer	----------	2
Brachydanio rerio	Zebra fish	1
Colius lala	Dwarf gourami	4
Enneacanthus gloriosus	Sunfish	1
Fundulus sp	Killifish	1
Lebistes reticulatus	Guppy	12
Asteonyx ruberrinus	Red tail	7
Pterophyllum scalare	Angel fish	3
Rasbora heteramorpha	----------	3
Rhinichthys atronasus	Striped dace	7
Rivulus harti	Trinidad fish	1
Xiphorus helleri	Swordtail	2

Arachnids

Eurypelma sp	Tarantula	1
Hadrurus hirsutus	Giant hairy scorpion	8

Insects

Apis mellifica	Honey bees	1 colony

Crustaceans

Cenobita clypeatus	Hermit crabs	75

Mollusks

Achatina variegata	Giant land snail	1
Ampularia sp	Apple snail	1
Liguus fasciatus	Florida tree snail	1
Planorbis corneus	Red snail or rams horn	25

Statement of the collection

Accessions

	Presented	Born	Received in exchange	Purchased	On deposit	Total
Mammals	81	60	----------	21	6	168
Birds	288	14	4	29	14	349
Reptiles	268	----------	3	178	2	451
Amphibians	90	----------	----------	40	----------	130
Fishes	4	----------	----------	----------	----------	4
Arachnids	12	----------	----------	----------	----------	12
Insects [1]	----------	----------	----------	----------	----------	1
Crustaceans	123	----------	----------	----------	----------	123
Mollusks	27	----------	----------	1	----------	28
Total	894	74	7	269	22	1,266

[1] 1 colony.

Summary

Animals on hand July 1, 1930	1,996
Accessions during the year	1,266
Total animals in collection during year	3,262
Removed from collection by death, exchange, and return of animals on deposit	761
	2,501

Status of collection

	Species	Individuals
Mammals	189	563
Birds	333	1,076
Reptiles	164	606
Amphibians	31	94
Fishes	14	47
Arachnids	4	11
Insects (colony)	1	1
Crustaceans	1	75
Mollusks	4	28
Total	741	2,501

ANIMALS NOT PREVIOUSLY EXHIBITED

This year has been outstanding in the number of species exhibited for the first time in the National Zoological Park. These are:

MAMMALS

Babirussa alfurus	Babirussa.
Cercopithecus petronellae	White-crowned guenon.
Dolichotis salinicola	Dwarf cavy.
Hylobates cinereus	Bornean gray gibbon.
Leontocebus rosalia	Silky or lion-headed marmosette.
Nyctereutes procyonoides	Raccoon dog.
Symphalangus syndactylus	Siamang gibbon.

BIRDS

Aprosmictus cyanopyzicus	Australian king parrot.
Crossoptilon mantchuricum	Brown-eared pheasant.
Goura sclateri	Sclater's crowned pigeon.
Lephophorus impeyanus	Himalayan Impeyan pheasant.
Polyplectron napoleonis	Palawan peacock-pheasant.
Priotelus temnurus	Cuban trogon.
Phasianus versicolor	Green Japanese pheasant.
Riccordia ricordii	Ricord's humming bird.
Trichoglossus novaehollandae	Blue-bellied lory.

REPTILES

Agkistrodon bilineatus	Mexican moccasin.
Ameiva abbotti	Abbott's swift.
Amphibolus barbatus	Bearded lizard.
Anolis equestris	Chameleon anolis.
Bitis arietans	Puff adder.

Bitis gabonica	Gaboon viper.
Bitis nasicornis	Rhinoceros viper.
Bothrops nigroviridis marchi	Green tree viper.
Bothrops nummifera	Jumping viper.
Chamaeleon senegalensis	Senegal chameleon.
Coluber jugularis caspius	European whipsnake.
Coluber leopardinus	Leopard snake.
Coluber longissimus	Aesculapian snake.
Coluber quatuorlineatus	European 4-lined snake.
Geomyda incisa	Guatemalan terrapin.
Laemanctus alticoronatus	Green basilisk.
Lampropeltis polyzonus	Tropical king or false coral snake.
Lejosophis gigas	Cobra de Paraguay.
Liocephalus beatanus	Beata curl-tailed lizard.
Loxocemus bicolor	American python.
Mabuya agilis	Guatemalan skink.
Naja hannah	King cobra.
Naja tripudans	Hooded cobra.
Oxybelis acuminatus	Pike-headed tree snake.
Pelusios heinrothi	Heinroth's turtle.
Tomistoma schlegeli	Malayan gavial.
Tretanorhinus variabilis	Cuban water snake.

AMPHIBIANS

Alytes obstetricans	Midwife toad.
Ambystoma mexicanum	Axolotl.
Bufo valiceps	Mexican toad.
Pleurodeles waltlii	Spanish newt.
Proteus anguinus	Blind salamander.

FISHES

Aequidens sp.	
Barbus ocellifer.	
Brachydanio rerio	Zebra fish.
Colius lala	Dwarf gourami.
Enneacanthus gloriosus	Sunfish.
Fundulus sp	Killifish.
Lebistes reticulatus	Guppy.
Asteonyx ruberrinus	Red tail.
Pterophyllum scalare	Angel fish.
Rasbora heteramorpha	Rasbora.
Rhinichthys atronasus	Striped dace.
Rivulus harti	Trinidad fish.
Xiphorus helleri	Swordtail.

ARACHNIDS

Hadrurus hirsutus	Giant hairy scorpion.

INSECTS

Apis mellifica	Honey bees	1 colony.

This excellent showing was made possible primarily by the exhibition facilities afforded in the new reptile house.

VISITORS

The great number of visitors who have been coming to the park since the opening of the reptile house has prevented such a decline in the year's attendance as exists in other institutions of public interest because of the economic depression which has so reduced travel. The estimated attendance as recorded in the daily reports of the park is as follows:

1930		1931	
July	186, 600	January	97, 600
August	170, 000	February	82, 948
September	221, 710	March	315, 750
October	130, 200	April	377, 207
November	105, 000	May	228, 500
December	36, 000	June	220, 000
		Total visitors for year	2, 171, 515

The attendance of organizations, mainly classes of students, of which we have definite record, was 34,026 from 649 different schools in 21 States and the District of Columbia, as follows:

States	Number persons	Number parties	States	Number persons	Number parties
Alabama	30	1	New Jersey	2, 972	49
Connecticut	192	2	New York	2, 946	30
Delaware	124	6	North Carolina	387	11
District of Columbia	11, 305	234	Ohio	1, 046	13
Iowa	29	1	Pennsylvania	7, 204	152
Illinois	76	1	Tennessee	75	2
Indiana	50	1	Virginia	1, 158	28
Kansas	326	1	West Virginia	161	5
Maine	74	1	Wisconsin	150	2
Maryland	5, 548	104			
Massachusetts	94	3		34, 026	649
Michigan	79	2			

Observations of the numbers of automobiles from distant States and countries has led to the taking of a census each day of the cars actually parked in the park at one time, from which the following tabulation has been prepared showing the percentages of cars from various States and countries by months:

State	Percentage, March	Percentage, April	Percentage, May	Percentage, June
Alabama	----------	0.02	----------	0.19
Arizona	----------	.04	----------	----------
California	0.06	.13	0.29	.16
Colorado	----------	----------	----------	.06
Connecticut	.16	.37	.26	.08
Delaware	.05	.33	.02	.25
District of Columbia	73	53	54	52.41
Florida	.14	.24	.38	.55
Georgia	.05	.07	.14	.25
Illinois	.07	.24	.12	.45

State	Percentage, March	Percentage, April	Percentage, May	Percentage, June
Indiana	.10	.07	.17	.46
Iowa	.03	.02	.06	.19
Kansas			.10	.08
Kentucky	.07	.02	.12	.27
Louisiana		.02		
Maine	.05	.09	.05	.03
Maryland	15.75	20.35	24.65	20.47
Massachusetts	.40	.96	.48	.46
Michigan	.15	.33	.19	.54
Minnesota	.10	.15	.02	.27
Mississippi	.05	.02		.08
Missouri	.05	.13		.20
Montana	.03			
Nebraska			.02	.11
New Hampshire	.05	.09		.14
New Jersey	1	2.54	.62	.62
New Mexico	.10		.05	
New York	1	2.10	.17	1.27
North Carolina	.26	.55	.94	1.65
North Dakota	.12	.04		.06
Ohio	.39	.72	1.16	1.75
Oklahoma	.03	.02	.05	.06
Oregon		.02		.03
Pennsylvania	.95	5.48	3.48	4.25
Rhode Island	.12	.20	.10	.06
South Carolina	.05	.02	.14	.24
South Dakota	.03		.03	.03
Tennessee	.03	.09	.17	.19
Texas	.07	.02	.05	.11
Vermont	.17	.07		
Virginia	4	10.77	11.20	10.40
Washington	1		.05	.03
West Virginia	.12	.51	.60	1.20
Wisconsin	.05	.09	.10	.03
Wyoming			.02	.03
Alaska				.06
Canada	.15	.07		.14
Cuba				.03
Canal Zone				.03
Philippine Islands				.03

IMPROVEMENTS

The most interesting event of recent years has been the opening of the public exhibition building for reptiles, amphibians, insects, and miscellaneous invertebrates. The construction of this building was started in March, 1930, and the exhibition was formally opened the evening of February 27, 1931. Some 3,000 people attended the reception, and the following day the building was crowded from morning to night. The formal opening was attended by a large number of officials of the United States Government and officials of other zoos who were particularly interested in the building. Among the latter were Dr. W. Reid Blair, director of the New York Zoological Park; C. Emerson Brown, director of the Philadelphia Zoological Garden; George P. Vierheller, director of the St. Louis Zoological Garden; Dan Harkins, director of Franklin Park Zoo, Boston; and Dr. Raymond L. Ditmars, curator of reptiles, New York Zoological Park.

Since its opening it has been by far the most popular and crowded building in the entire Zoo. Natural habitat for the reptiles has been provided as far as possible. There is a special ventilating system for the public and a special heating system for the reptiles. Light is all from above so that the visibility is far superior to any-

thing we have ever had before. This building, containing over a hundred cages, fills a long felt need in the Zoo.

With a view to helping house the Victor J. Evans collection, Congress added $4,500 to the appropriation, and with this money we have built a series of large mammal paddocks with sheds, runs for cranes, and large outdoor cages for pheasants.

Out of money unexpended from a previous year and reappropriated for this fiscal year is being built a flight cage for the eagles, to replace the one that had to be torn down to clear the site for the reptile house. Other cages will be constructed near by, so that all of the birds will be grouped in the general vicinity of the bird house.

Contracts have been let for new boilers at the central heating plant, to replace two secondhand ones that had been installed 29 years ago. The main steam line from the central heating plant to the buildings began to give way during the early fall, and certain of the steam lines supplying individual buildings began to develop leaks, which indicated that they could no longer be successfully repaired. This matter was presented to Congress, with the result that sufficient money was provided to renew the lines that showed most imminent danger of giving out. The new pipes are planned to be a portion of an extensive central conduit system when finally completed.

A quantity of earth from near-by excavations was made available to the park without cost, and, by carefully planning the dumping of this, three considerable level areas were developed on which we are now able to place outside paddocks, runs, and cages.

NEEDS OF THE ZOO

Since completion of the reptile house, the next building on our program, the small mammal and great ape house, becomes the one most urgently needed at the present time. We have no suitable quarters at all for these groups of animals, both of which are represented in the collection by continually increasing numbers of interesting species. Plans and specifications for this building are now being prepared under the appropriation of $4,500 made available by the last Congress for this purpose.

Following this, the next exhibition building needed is one for the pachyderms. A room to complete the bird house is also needed.

Respectfully submitted.

W. M. Mann, *Director.*

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

APPENDIX 7

REPORT ON THE ASTROPHYSICAL OBSERVATORY

SIR: I have the honor to submit the following report on the activities of the Astrophysical Observatory for the fiscal year ended June 30, 1931:

PLANT AND OBJECTS

This observatory operates regularly the central station at Washington and two field stations for observing solar radiation on Table Mountain, Calif., and Mount Montezuma, Chile. The station at Mount Brukkaros, Southwest Africa, which was established by the National Geographic Society, is being continued for the present in cooperation with the Astrophysical Observatory with funds donated by a friend of the Institution. In addition the observatory controls a station on Mount Wilson, Calif., where occasional expeditions are sent for special investigations.

The principal aim of the observatory is the exact measurement of the intensity of the radiation of the sun as it is at mean solar distance outside the earth's atmosphere. This is ordinarily called the solar constant of radiation, but the observations of past years by this observatory have proved it variable. As all life, as well as the weather, depends on solar radiation, the observatory has undertaken the continued measurement of solar variation on all available days. These measurements have now continued all the year round for 12 years. As will appear in this report, recent studies indicate that the permanent continuation of these daily solar-radiation measurements may have great value for weather forecasting. In addition to this principal object the observatory undertakes spectroscopic researches on radiation and absorption of atmospheric constituents, radiation of special substances, such as water vapor, ozone, carbonic-acid gas, liquid water, and others, and the radiation of the other stars as well as of the sun.

WORK AT WASHINGTON

Funds having been appropriated by the Congress to print Volume V of the Annals of the Astrophysical Observatory, the year was spent principally in preparing text, tables, and illustrations expressing the results of observations made since August, 1920, at the several stations.

As stated in previous reports, much effort had already been expended in reducing the observations made at Table Mountain, Calif., but without satisfactory results. The atmosphere above Table Mountain, though to the eye appearing very fine and clear, contains variable amounts of ozone, water vapor, and dust, which produce embarrassing difficulties in computing the solar constant of radiation. Daily measurements of the amount of atmospheric ozone by the method of Dobson had been in progress at Table Mountain, since August, 1928, but they require fully as much time for reduction as does the solar constant itself. Fortunately, as described in last year's report, we were able to devise a simple method based on our bolographic work whereby corrections can be made easily for the absorption of ozone on all days when solar-constant measures are made at Table Mountain. All the Table Mountain solar-constant values from the beginning there in 1925 have now been corrected for ozone absorption.

The changes of haziness and of absorption associated with variations of atmospheric water vapor make a difficulty of a more serious nature. After several unsuccessful attempts to vary the Montezuma procedure to suit Table Mountain conditions, the process of reduction of the short-method solar-constant determinations at Table Mountain was radically changed. It will be recalled that the essence of the short method consists in employing pyranometer measurements of the brightness of the sky near the sun as an index of the prevailing atmospheric transparency.

If the brightness of the sky were unaffected by varying quantities of smoke or dust, we should expect the normal change of its brightness from day to day to be exactly determined by the quantity of atmospheric water vapor prevailing. In other words, there would be a normal relation between pyranometry, precipitable atmospheric water vapor, and atmospheric transparency, for the different wave lengths. But if unusual degrees of dustiness or smokiness prevail, then the pyranometer will record a positive or negative excess from the normal value proper to the prevailing quantity of precipitable water. This " excess " will be associated with changes in the atmospheric transmission coefficients for all wave lengths.

On these lines we have worked out new varieties of the short method of determining the solar constant of radiation applicable to conditions at Table Mountain and Mount Brukkaros. We have rereduced all the observations made at these stations according to these new methods. Great improvement in their solar-constant determinations resulted, although it must be confessed that neither of these two stations yields results as generally satisfactory as does Montezuma.

COMPARISON OF RESULTS

With the completion of the reduction of all the solar-constant observations from the three field stations results of much interest are found by comparing them. Figure 1 shows the monthly mean solar-constant values derived from Table Mountain, Montezuma, and Mount Brukkaros since 1926. The probable error of the weighted mean curve shown as a heavy line in Figure 1 is less than 0.1 per cent. In short, it is adequately accurate to show all that needs be known of the general march of solar variation.

Figure 2 shows the preferred monthly mean solar-constant values from 1920 to 1930, inclusive. The extreme range of it is 2.8 per cent. Although apparently so irregular, Figure 3 shows that the march of solar variation may be expressed with surprising fidelity as the sum of five regular periodicities, of 68, 45, 25, 11, and 8 months' intervals. It is interesting to note that, though derived with no regard to it, all of these intervals turn out to be nearly related to the 11¼-year sun-spot period. Thus 68 months is its half, 45 months its third, and so on. Other periods are found which are not so long-lived as these. Thus, curve H in Figure 3 shows periods of 45 and 5.6 days, respectively, which lasted throughout the year 1924. The excellent representation of the original curve A by the sum of the five periodicities, as shown at B, encourages me to give in curve I the expected march of solar variation in 1931 and 1932.

Figure 4 gives the results of an attempt to represent the temperatures of Washington, D. C., and Williston, N. Dak., as made up of periodicities having these same five intervals, 68, 45, 25, 11, and 8 months. It proved necessary to add a period of 18 months in each case. The original temperature curves A and C are found by taking consecutive means of 5-month departures from normal. Thus, 1/5 (Jan.+Feb.+Mar.+Apr.+May): 1/5 (Feb.+Mar.+Apr.+May+June), and so on. This eliminates the shorter irregularities and brings out prominently the principal departures from normal temperature that have occurred since 1918.

Curves B and D are 5-month consecutive means of curves representing the observed march of temperature as the sum of the six periodicities above described. I do not insist that this method of treatment gives certainty as yet, but I look forward for five more years to 1936, when it can be subjected to a more rigorous test. Time will show whether or not it is the germ of the method of forecasting weather for future years, to which Langley looked forward when he founded the Astrophysical Observatory.

The comparison of stations shows that the *daily* solar-constant values are not as accurate as are needed. Montezuma results are by far the best. Yet they lack many days of completeness and many

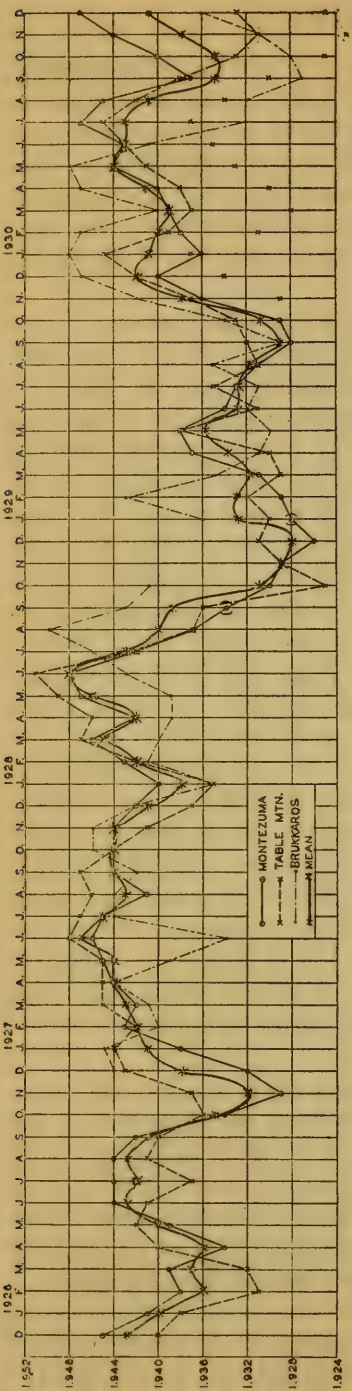


FIGURE 1.—Monthly mean solar-constant values derived from Table Mountain, Montezuma, and Mount Brukkaros since 1926

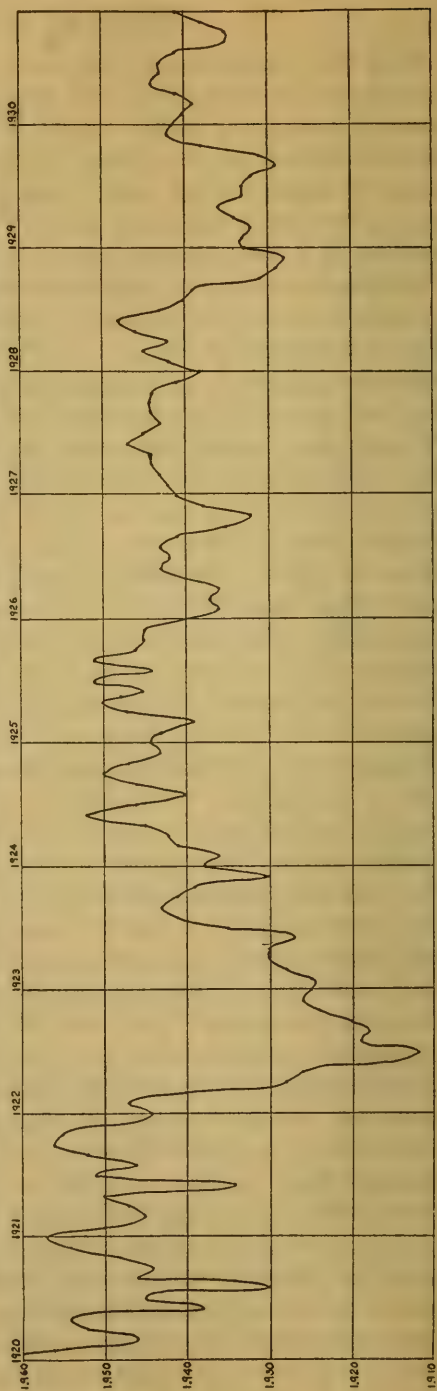


FIGURE 2.—Preferred monthly mean solar-constant values, 1920–1930

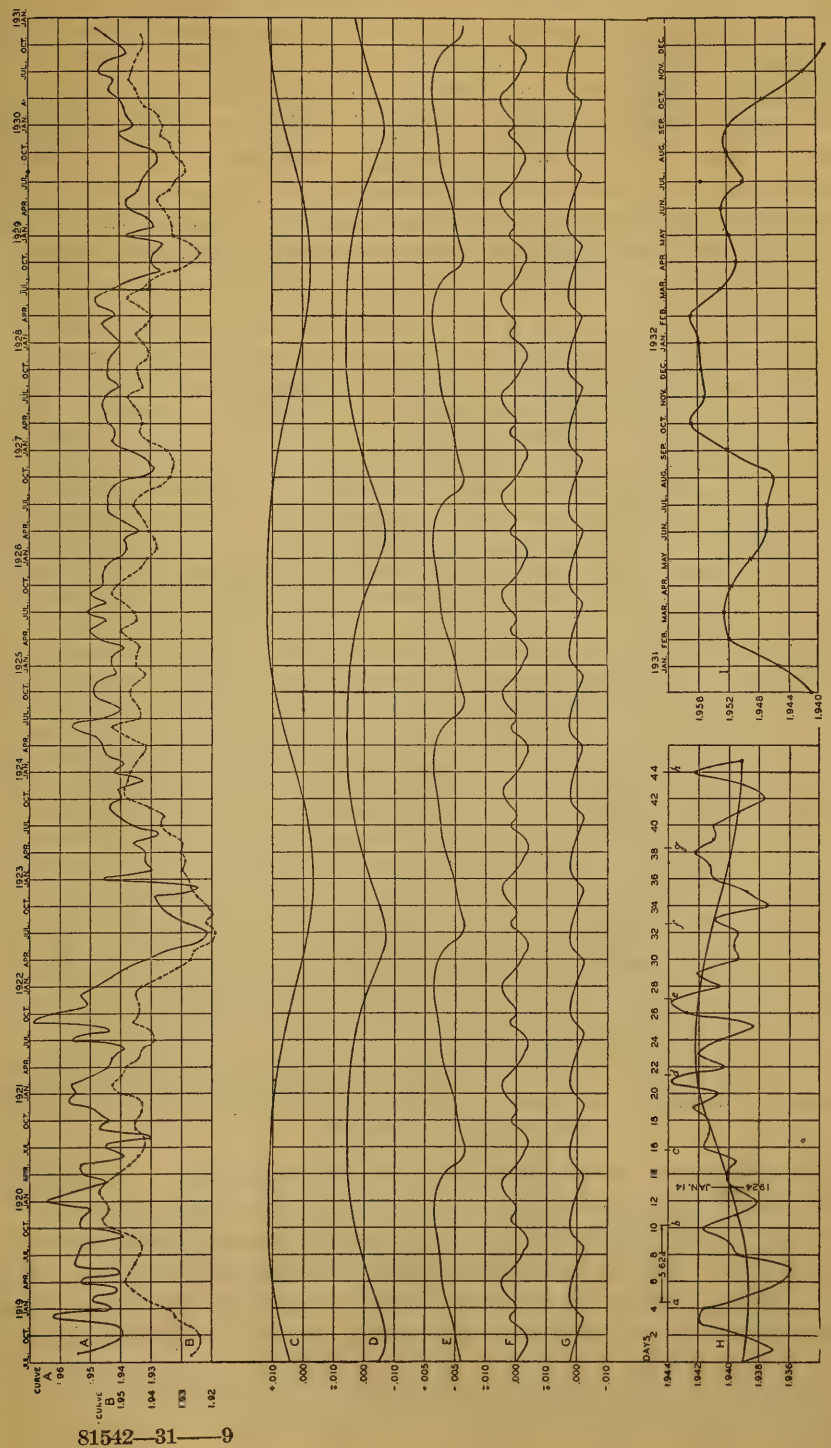


FIGURE 3.—Solar variation represented by five regular periodicities

days represented are unsatisfactory. It is indeed almost beyond the limit of possible accuracy to observe the solar constant day after day with such exactness that the differences between the absolute values shall always evaluate changes correctly if reaching one-third of 1 per cent or more. This is what is needed. We have in mind a few improvements which may bring us to this degree of accuracy at Montezuma, but unless other stations superior to Table Mountain and Brukkaros are found it seems doubtful if fully satisfactory daily values are obtainable to supplement the Montezuma record.

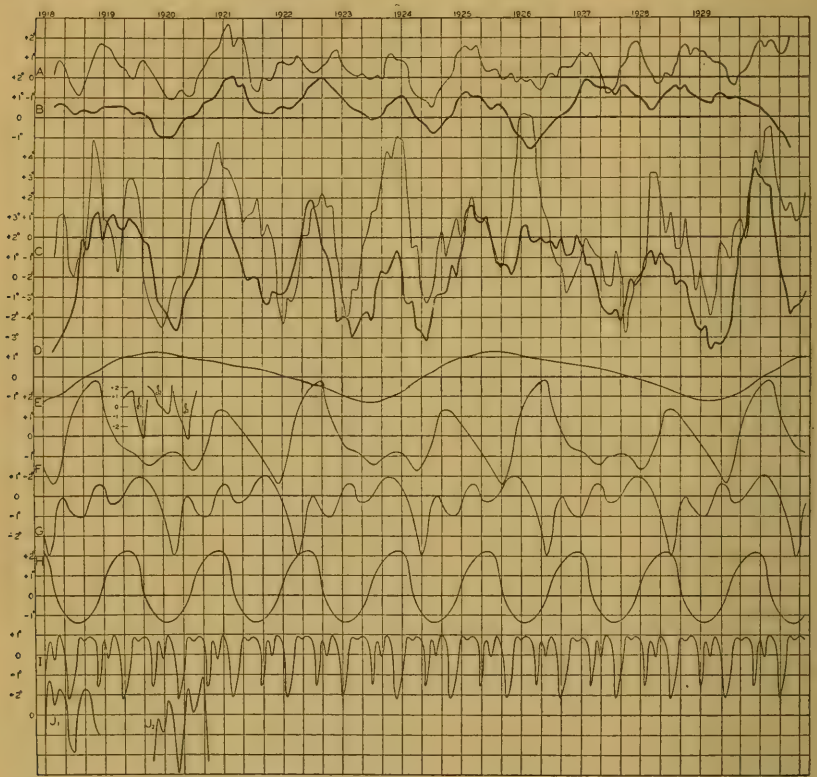


FIGURE 4.—Washington and Williston temperatures associated with solar periodicities. Five-month consecutive means

Further studies made during the year tend to confirm the impression stated in last year's report that temperatures and barometric pressures in the United States respond by opposite trends to positive and negative sequences of change in daily solar-radiation values. As yet, however, the evidence is not fully satisfactory owing to the imperfection of the daily record of solar changes, as just explained.

To promote statistical studies along these lines, a new instrument designed to discover and evaluate periodicities in solar and weather records has been designed. Its construction was aided by a grant of

$1,000 from the Research Corporation of New York. At the close of the fiscal year the instrument was almost ready for use, having been constructed by A. Kramer at the instrument shop of the Observatory.

FIELD STATIONS

In cooperation with Doctor Wulf, of the Fixed Nitrogen Research Laboratory, of the Department of Agriculture, an investigation has been carried through at Table Mountain, Calif., on the absorption of well-determined quantities of ozone in the visible spectrum. In this research, ozone-laden air contained in special absorption cells was interposed before the slit of the spectrobolometer which records the energy of the solar spectrum. A new, independent method of determining the atmospheric ozone content was worked out and applied. Its results agree nearly with those determined by the method of Dobson.

The daily observation of the solar constant of radiation has been carried on regularly at the three field stations: Table Mountain, Calif.; Montezuma, Chile; and Mount Brukkaros, Southwest Africa. The latter station has been supported by grants from John A. Roebling. Impressed by the probability of useful weather applications, Mr. Roebling has made a further grant to finance an expedition of a year's duration in Africa and outlying regions to endeavor to find a site equal to Montezuma, Chile, for solar-radiation work. Accompanied by Mrs. Moore, A. F. Moore, who has had long experience at our mountain observatories, occupied Fogo Island peak in the Cape Verde Islands for several weeks, and is now in Southwest Africa testing various high mountain sites in comparison with Mount Brukkaros.

A fire caused by a kerosene heater destroyed the computing room at Montezuma station, with mathematical tables and instruments used in the reductions. The observations suffered a few days of delay before new tables could be sent, but no days were lost to the permanent record of the station.

PERSONNEL

At Washington the personnel is unchanged since the last report, except that Oliver Grant served as additional computer throughout the year in the preparation of Volume V of the Annals. Also George Cox served from November, 1930, on the reduction of ozone observations and other computing. Both young men were compensated from the Roebling funds.

C. P. Butler, formerly assistant at Montezuma, was placed in charge of that station on January 11, 1931, vice H. H. Zodtner, trans-

ferred to Table Mountain to carry on there during the absence of A. F. Moore. Walter Watson, jr., reported for duty as assistant at Montezuma February 1, 1931.

SUMMARY

The principal work accomplished has been the development of new methods and the complete reduction of all solar-constant observations made at the field stations since 1920. The results with accompanying text and illustrations have been collected and sent to press as Volume V of the Annals of the Observatory. Comparison of values shows that the variation of the sun indicated by monthly mean values since 1920 is determined with sufficient accuracy for all purposes. The probable error of monthly means is less than 0.1 per cent. Solar changes found since 1920 range to 2.8 per cent. Daily observations are less satisfactory than monthly means, but improvements are proposed. An expedition is in Southwest Africa endeavoring to discover a site for a solar radiation observatory equal to Montezuma, Chile. A new instrument for the periodic analysis of solar and weather data is nearly completed.

On the whole the outcome of 10 years of intensive study of solar radiation, as brought together in the text of Volume V of the Annals of the Observatory now in press, is very interesting. It encourages great hope that the causes of weather may be traced in solar variation to such a degree as to enable the skilled meteorologist to forecast principal changes of weather far in advance.

Respectfully submitted.

C. G. Abbot, *Director.*

The Secretary,
Smithsonian Institution.

APPENDIX 8

REPORT ON THE DIVISION OF RADIATION AND ORGANISMS

SIR: I have the honor to submit the following report on the activities of the Division of Radiation and Organisms during its second year ending June 30, 1931.

RESEARCH IN PROGRESS

Building around the central idea of a laboratory combining experimental work in biophysics with fundamental experimentation in physics and chemistry, researches have been carried forward in both these fields. The phototropic experiments upon oat coleoptiles previously reported have been carried further with considerable refinement of technique. The carbon dioxide assimilation of wheat has been studied as a function of intensity in artificial light. Preliminary experiments with algae have been initiated with a view to determining carbon dioxide assimilation as a function of wave length and intensity, growth rate as a function of wave length and intensity, and death point as a function of wave length, and time-intensity dosage. The propagating chamber which was developed by the division has been used in cooperation with the Department of Agriculture for the purpose of investigating the effects of artificial light, humidity, and temperature upon the growth of certain desert and tropical plants.

In the field of pure physics and physical chemistry the major part of the time has been devoted to the development of the necessary equipment for the general intensity and infra-red work contemplated. The intensity distribution in the mercury spectrum has been determined directly. In cooperation with the Fixed Nitrogen Research Laboratory the spectra of HCl, HCN, and the halogen substitution products of benzene have been investigated in the region between the visible and 2μ.

PHOTOTROPISM

In a preliminary experiment the phototropic response of the oat coleoptile toward light was determined comparatively for different colors or spectral regions by means of light filters. The results of this experiment may be conveniently summed up in the accompany-

ing graph, Figure 1. The spectral regions used are indicated by the transmission curves. The wave lengths are plotted as abscissae and the percentages of light transmitted by the filters as ordinates. The continuous curves indicate the regions of transmission for each of the filters; the blue filter (B) transmitting the region between 4,000 and 5,000 Å units, the green filter (G) transmitting between 4,800 and 5,900Å units, the yellow filter (Y) transmitting all visible wave lengths longer than 5,300 A, and the red filter (R) transmitting all wave lengths longer than 5,900 Å. For the sake of convenience the observable response curves have been plotted upon the same diagram in dotted lines. The response in the red was found to be zero. The response to yellow light has been arbitrarily assigned the value

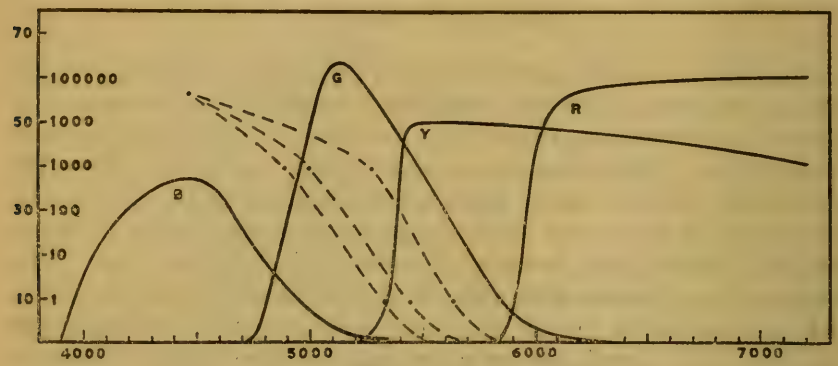


FIGURE 1.—Phototropism by filter method

---------- Phototropic sensitivity.
———————— Transmission of filters.

"unity." Using a logarithmic scale (inside the frame) the relative responses in green and blue have been indicated. In the right-hand curve each point is plotted at the wave-length center of gravity of the region for each filter, in the case of yellow, only counting those wave lengths not included by the red filter.

This curve plotted through these three points may be regarded as a first approximation. On the basis of this curve the centers of gravity were redetermined where each wave length was weighted according to responses as indicated by the first approximation curve. The middle curve was thus obtained by simply shifting the points to the weighted center of gravity wave lengths. Using this second approximation curve as the basis for again reweighting, the third or left-hand curve was obtained. Reweighting was, of course, impossible for the blue region, as data are not available on the shorter wave-length side.

These results are presented for the sake of comparison with the results obtained in the more elaborate experiment carried out with

the use of a monochromator for obtaining narrower spectral regions or purer colors. In this way more points could be secured in determining the response curve, and the amount of correction required for shift of center of gravity minimized. The results of this second experiment are shown in Figure 2. Points determined showing the relative response as a function of wave length are indicated by solid dots plotted on an arithmetic scale (inside frame). These points have again been plotted as crosses on a logarithmic scale as indicated outside the frame. The results of the earlier experiment are shown as circles.

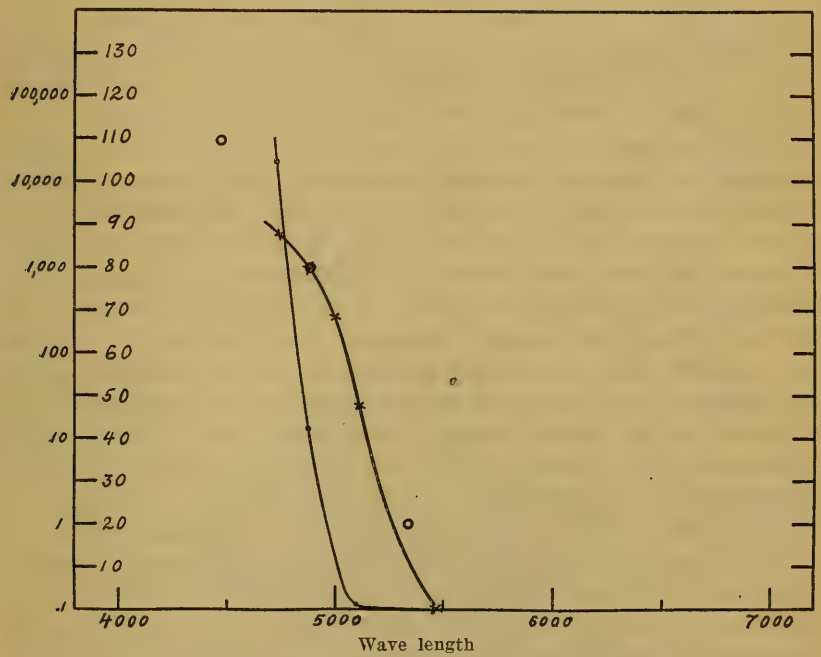


FIGURE 2.—Phototropism by monochromator method
—X— sensitivity on logarithmic scale (indicated outside of box)
—O— sensitivity on linear scale (indicated inside of box)

Agreement between the two experiments is quite striking considering the rough nature of the earlier experiment.

In the phototropic experiments the biological technique has been developed by Doctor Johnston and the intensity relations determined by Doctor McAlister. The demands upon physical technique were so extreme that special vacuum thermocouples had to be developed and the galvonometer deflection measured by means of a thermal relay.

It is interesting to note in this connection that Blaauw had secured similar curves for phototropic response, measuring instead of relative

intensity, the time required for the first observable response. That these curves determined by time of initial response should be almost identical to those determined by quantitative intensity ratios strongly points to a possible time-intensity product as the effective factor in controlling the phototropic response. This is particularly interesting, as such a relation is found to hold to a first approximation in the case of photographic plates on the one hand and the erythema dosage for the human skin on the other, as well as in most simple systems.

PHOTOSYNTHESIS

Special all-vitreous growth chambers have been developed wherein the carbon dioxide assimilated by wheat plants can readily be determined. The accompanying illustration (pl. 1, fig. 1) indicates the type of chamber developed; the plants are inserted through holes in the cork stopper and held in place by cotton, the roots being immersed in a nutrient solution contained in the Erlenmeyer flask; the leaves extend upward in a special tubular compartment. This tubular compartment is double walled, permitting the circulation of water for the maintenance of temperature. Illumination is secured through these lateral walls. For experimentation with the blue and ultra-violet similar containers have been made of corex. Air is conditioned by a humidifier and introduced through an airflow regulator into the base of the leaf chamber. It is expelled at the top and a portion passed through a conductivity cell. The variation in carbon-dioxide content is thus determined by changes caused in the conductivity of a potassium hydroxide solution. The record is made continuously by a Leeds and Northrup automatic bridge.

In later experiments eight 300-watt lights mounted upon adjustable arms were substituted for those shown. Thus 2,400 watts could be placed at any distance from 20 centimeters to a meter, the illumination being lateral and strictly symmetrical. A thermocouple with a cylindrical receiver is introduced through the top in order to determine accurately the relative intensities for different adjustments. The accompanying diagram (fig. 3) shows a typical run carried out during a single day, showing the carbon dioxide assimilated for each different light intensity.

To a first approximation the curve is apparently made up of two straight-line segments. While this appears to support the classical theory of Blackman concerning limiting factors, no such conclusion should be drawn until more rigid control can be maintained. The small changes in values which may result may be sufficient to obliterate the apparent linearity.

This work differs from earlier work in that it is carried out with entire plants instead of individual leaves cut from plants as previously used. The results presented must be regarded as simply preliminary, since certain difficulties are yet to be overcome. These experiments are preparatory for those contemplated wherein approximately monochromatic light will be used. The development of equipment for this more elaborate experiment is nearing completion.

In this work Doctor Johnston has carried out the physiological phases of the experiment and Mr. Hoover has perfected the carbon dioxide recording apparatus loaned to the division by the Fixed Nitrogen Research Laboratory and has carried out the observations with this instrument.

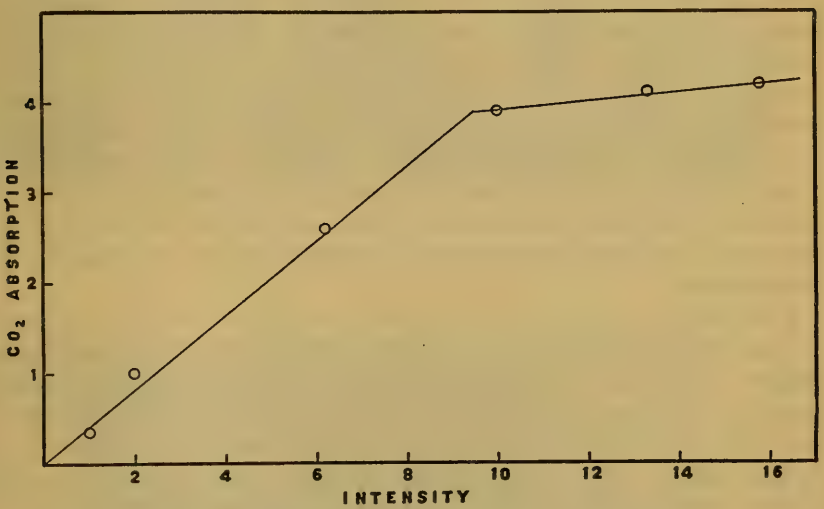


FIGURE 3.—Dependence of photosynthesis on light intensity

ALGAE INVESTIGATIONS

As a result of the cooperation of the Department of Agriculture Doctor Meier has been able to initiate a program of algae investigations which will be extended through the following year as a part of her work as National Research Council Fellow in the division. Preliminary experiments have been carried out in which the many special types of algae which she has collected have been subjected to different nutrient solutions, and to different temperature and illumination conditions, with a view to determining the conditions required for the experiments contemplated.

She has found that certain varieties may be grown in a colorless condition in the dark and subsequently gain their normal coloration

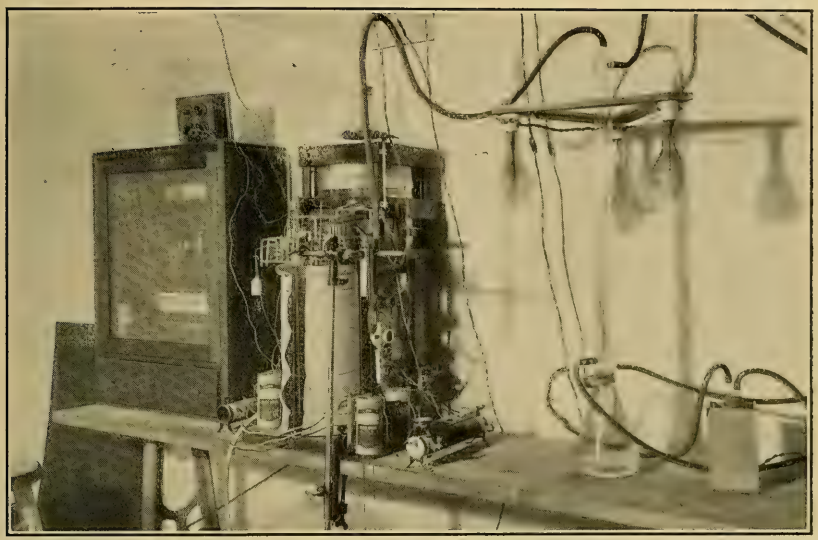
upon exposure to light. These will be used for experiments in which coloration is determined as a function of wave length and intensity.

Provision has been made for growing a large number of algae cultures under comparable conditions. For this purpose two tables have been constructed, each with four glass-bottomed reservoirs. Small Erlenmeyer flasks containing solution cultures of algae are immersed in these large water baths and illuminated by artificial light from below. A circulating system maintains each set of four reservoirs at the same temperature. The small Erlenmeyer flasks containing the algae are maintained in agitation by a common driving mechanism. Only the illumination is different in one reservoir from that in another. Thus the effect of modifying wave length or intensity may be determined for 18 different samples at once. The flasks may be supplied with small manometers in order to make a rough check on the photosynthetic processes as they are affected by growth and modification of conditions of illumination. All this work, however, is simply an auxiliary to the more careful experiment to be carried out intensively in a modified Warburg apparatus wherein differential nephelometric measurements are made as well as the usual manometric measurements upon oxygen concentration. The apparatus for these more refined measurements is in progress of construction.

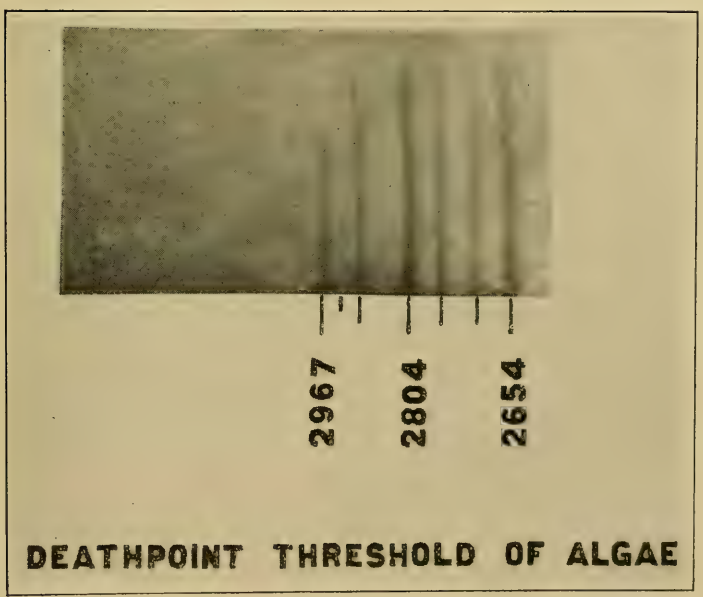
A large quartz spectrograph has been constructed, using two quartz prisms some 15 cm. on a side with quartz lenses of a 60 cm. focal length. By means of the spectrograph unicellular organisms distributed uniformly on a slide or in a culture dish may be exposed simultaneously to different regions of the spectrum. Modifications in growth rate or resulting death point may be observed comparatively for different wave lengths. In Plate 1, Figure 2, the results of a preliminary exposure of algae are readily observed. For all wave lengths shorter than 3,000 Å the typical mercury lines appear just as they would be seen on a photographic plate. Here, however, they are recorded by the absence of the organisms after a week's growth subsequent to exposure. It should be noted that although the lines on the long-wave length side of 3,000 Å are stronger by actual thermocouple determination they have not affected the algae colony.

For convenience Figure 5 may be referred to in this connection, which shows the relative intensities of the different lines of the mercury arc as determined in an experiment to be discussed later in another connection.

By a succession of such experiments, wherein the first noticeable killing can be determined for different exposure times, the relative dosage of different wave lengths can be determined.



1. SPECIAL GROWTH CHAMBER FOR WHEAT WITH CARBON DIOXIDE RECORDING MECHANISM



2. PLATE CULTURE OF ALGAE EXPOSED TO MERCURY SPECTRUM

EFFECT OF ARTIFICIAL LIGHT AND CONTROLLED HUMIDITY

Greenhouse-grown palm (left) compared with a similar one grown under controlled artificial light and humidity conditions (right). Tremendous growth of roots had burst the pot of the latter and necessitated repotting.

COOPERATIVE WORK WITH THE BUREAU OF PLANT INDUSTRY, DEPARTMENT OF AGRICULTURE

A first experiment has been carried out in the general plan of cooperation between the United States Department of Agriculture and the division, in the crop physiology and breeding investigations of Dr. Walter T. Swingle. In this experiment the effects of controlled radiation, humidity, and temperature on certain tropical and xerophytic plants were investigated in a preliminary way. The results may be summed up as follows:

First, it was found possible to maintain conditions which yielded in the case of date palms, ten times greater growth rate than that exhibited by the control plants in the greenhouse (pl. 2). Second, humidity was shown to be a controlling factor in the growth of date palms. Third, the ephedra under these conditions yielded two crops, both larger than the single crop grown in the greenhouse. Fourth, conditions maintained, perhaps due to the red-rich, blue-poor radiation, yielded exceptional root development in both palms and pandani. Fifth, pandani have shown exceptional offshoot development, a matter of great significance in propagation of identical individuals. If the same proves true of palms, as seems likely, this result is of considerable practical importance.

In this experiment the plant conditions and developments were in the hands of Dr. Florence E. Meier, associate physiologist in the Bureau of Plant Industry. Members of the division assisted during the experiment by the development of control apparatus in connection with a propagating chamber for maintenance of constant humidity and temperature.

In further preparation for the cooperative program the Department of Agriculture has constructed four additional individual growth chambers of a larger and slightly modified design but in general similar to the four already constructed by the division. A humidifier to serve all the individual growth chambers has been constructed by their shops and is in progress of installation. It should be possible to begin experimentation with these individual growth chambers some time during the coming fall.

SPECTROSCOPIC DEVELOPMENTS

INFRA-RED

A large spectrograph, equipped with salt prisms, which will record intensity distribution of radiation from the visible to 15μ in the deep infra-red, is nearly completed. A preliminary grating set-up shows

remarkable possibilities of an old grating ruled for the Smithsonian by Rowland for infra-red work shorter than 6μ. Two echelette gratings have been ruled for the division by the Johns Hopkins University and have been given preliminary tests in the near infra-red. While these tests have so far been discouraging, they may still prove satisfactory in the deeper infra-red beyond 6μ, for which they were more particularly designed.

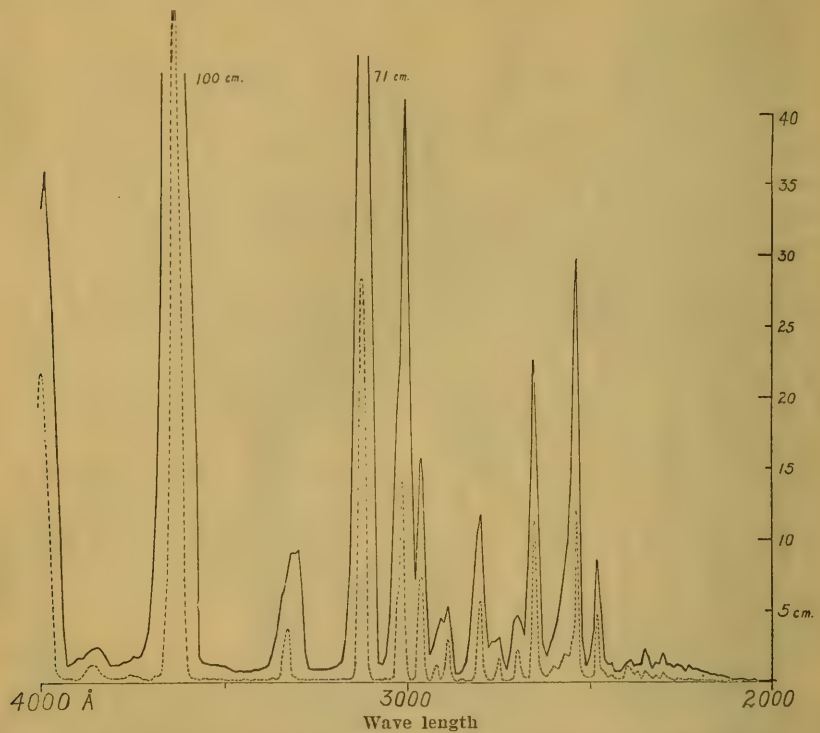


FIGURE 4.—Comparison of spectra using single and double monochromators

———— single monochromator.
- - - - - - - - double monochromator.

The near infra-red work has been continued in cooperation with the Fixed Nitrogen Research Laboratory. Investigations of the halogen derivatives of benzene have been extended; the near infra-red spectrum of HCN has been investigated in both liquid and vapor, the results being presented at the Pacific coast meetings of the Physical Society during the summer. Investigations of HCl in vapor and dissolved in carbon tetrachloride have been carried out with a view to determining the rotational freedom existing in such solutions. This work has been carried out by Doctor Brackett, in association with Urner Liddel and Dr. Oliver Wulf, of the Fixed Nitrogen Research Laboratory.

ULTRA-VIOLET

The energy distribution in the mercury arc has been measured by Doctor McAlister at a resolution 10 times greater than the previous work. These results were presented at meetings of the Physical Society. This work has been made possible through the loan of two quartz monochromators by the Bausch & Lomb Optical Co. Figure 4 shows by the solid line the spectrum plotted with a single monochromator; it is replotted with dotted lines where two monochromators are used, arranged so that the light passed first through one

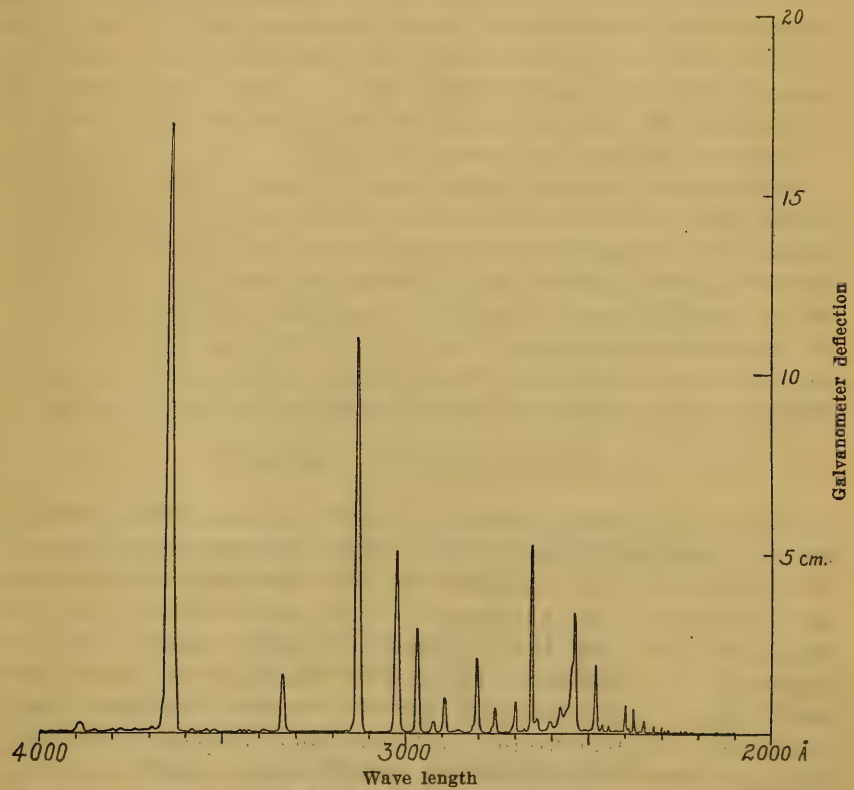


FIGURE 5.—Intensity record of mercury arc spectrum using double monochromator

and then through the other. It will be seen that not only is the background of energy observed between lines greatly reduced, but also the lines are much narrowed, or, in other words, the resolution is greatly increased. The intensities of the lines are only reduced by a factor of two where the resolution and freedom from scattering is increased by a larger factor. Figure 5 shows the spectrum plotted with the double monochromator arrangement but a still narrower slit.

As a result of these measurements of spectral distribution in the visible and ultra-violet, an invitation has been extended to the division to be represented on the committee on ultra-violet measurement standards of the Illuminating Engineers Society. Doctor McAlister represented the division in the first of these meetings during the summer, where plans were made for cooperation in the development of suitable standard sources and technique for intensity measurement.

THERMOCOUPLE TECHNIQUE

As a result of the development of the specially sensitive vacuum thermocouples by members of the division many requests have come in for the construction of couples for other institutions. This has been possible only in exceptional cases. Couples have been constructed for the University of California, for the Department of Agriculture, and for the General Electric Co.

As an adjunct of these highly sensitive couples a special thermocouple multiplier has been developed which is capable of magnifying galvonometer deflections by any desired ratio up to 1,000 times. It has the special advantages of making this magnification linearly for any amplitude and of introducing no appreciable added instability into the measurements. This technique is applicable not only to the infra-red investigations but also to the phototropic experiment where the measurement of extremely small intensities is required.

REPORT ON THE WORK OF INDIVIDUALS

Dr. Earl S. Johnston, plant physiologist, became a full-time member of the staff in February, 1931. Doctor Johnston began his work with the division as a consultant while still a professor at the University of Maryland. He has taken an active part in the plans and developments along the lines of plant physiology almost from the beginning. His addition to the staff has made possible much more rapid progress in the biological phases of the work. He has aggressively pushed the phototropic experiments and the wheat experiment, and has assisted in the preliminary growth chamber experiment. His assistance in matters of publication has been very valuable.

Dr. E. D. McAlister became a member of the staff in September, 1930, devoting half of his time to the work of the division and the other half to the work of the Research Corporation. During the latter part of the year all his time was assigned to the work of the division. Doctor McAlister's long experience in thermocouple technique and infra-red measurements makes him unusually well qualified for the work of the division. He has carried out the most exacting phases of thermocouple observations on intensity and wave-length

distribution in the phototropic experiment. He has materially contributed to the development of the preliminary growth chamber and controls. He has carried out an investigation on the distribution of the mercury arc in the blue and ultra-violet. He has furthermore handled a large part of the technical developments of thermocouples. This is in addition to his work with the Research Corporation, for which he has carried out exhaustive investigations of the possibilities of the thermopile for use as a source of electromotive force in applied fields. He has carried out preliminary developments of the nephylometer for general experimental use.

Leland B. Clark, in addition to carrying on all the regular glass-blowing, has handled the vacuum technique development in connection with the thermocouples. He has constructed a practical butylphthalate pump of original design. His assistance in many phases of special laboratory technique is of great value to the division.

William H. Hoover has carried out a large part of the equipment and operation of the preliminary growth chamber; he has adjusted and increased the sensitivity of the carbon dioxide detecting device loaned to the division by the Fixed Nitrogen Research Laboratory and he has installed and put in operation temperature-control equipment for the individual wheat experiment. He has designed and installed a new thermostat which greatly increases the stability of the carbon dioxide recording mechanism. This is in addition to his work with the Astrophysical Observatory, for whom during the year he has spent a month in the development of photometric equipment and two months on a trip to Table Mountain, as well as some computational work on the annual report.

Miss Stanley, in addition to the regular stenographic work, now a considerable load, has ably handled all our bookkeeping in connection with purchases.

L. A. Fillmen, a mechanic of wide experience in apparatus and equipment construction, became a half-time member of the staff in August, 1930. His experience and ability have contributed largely in the development of equipment for the laboratory. Through the courtesy of the Fixed Nitrogen Research Laboratory, Mr. Fillmen worked for several months in their shop while our shop was being equipped.

PERSONNEL

During the fiscal year the personnel was as follows:

Chief.—Dr. Frederick S. Brackett.

Research associate.—Dr. Earl S. Johnston.

Associate research assistant.—Dr. E. D. McAlister.

Research assistant assigned by the Astrophysical Observatory.—W. H. Hoover.

Research assistant.—L. B. Clark.
Stenographer.—Virginia P. Stanley.
Mechanic.—L. A. Fillmen.

EXTENSION OF HOUSING

The large room No. 14 of the basement was added to the laboratory in order to provide for the intensity measurements in the visible and ultra-violet and development of the algae and wheat experiments. Partitions have been built in order to provide sufficient dark-room space. A room has also been constructed in order to make possible the accommodation of a glass-blowing course, which Mr. Clark has undertaken for the Department of Agriculture. Room No. 12 has been equipped as a thoroughly up-to-date machine shop by the Research Corporation, with whom the division shares Mr. Fillmen's time. Room No. 13 has been equipped for the shopwork of the members of the division.

COOPERATION

The division has been especially fortunate in the cordial cooperation of other institutions. This includes near infra-red work with the Fixed Nitrogen Research Laboratory, experiments in higher plants with the Bureau of Plant Industry, sharing of equipment and personnel with the Research Corporation, personal assistance from the Astrophysical Observatory, assistance in the form of apparatus and equipment from the Bausch & Lomb Optical Co. and the General Electric Co.

GENERAL

In undertaking experimental work along those biological lines wherein radiation plays an important part it is inevitable that men are required with special training and experience not only in biology but also in the fields of physics and chemistry. To bring about the cooperation in these border-line problems of men with specialized training in each of these fields has been the essential dominating idea in the development of the division. The lack of men with specialized chemical training in the organic and photochemical fields is more and more keenly felt. Furthermore although the division is well provided with people of highly specialized training in the field of plant physiology and physics it is handicapped by the lack of sufficient laboratory assistance in order to carry out their ideas and make their time effective. Without increasing its program or widening the scope of its activities the division urgently needs sufficient funds to round out its personnel in this way.

SUMMARY

The end of the second year finds the research work of the division well under way with preliminary results on phototropism, and on carbon dioxide assimilation of wheat; algae experiments on light adaptation have been initiated; promising experimental work has been begun in cooperation with the Department of Agriculture; and spectroscopic measurements have been completed in both the ultra-violet and infra-red. The laboratory space has been extended and equipped for the expansion of the work. Shop facilities have been added to care for the apparatus development. Essential additions have been made to the division personnel in both the physiological and physical sides of the project.

Respectfully submitted.

F. S. Brackett, *Chief.*

Dr. C. G. Abbot,
Secretary, Smithsonian Institution.

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APPENDIX 9

REPORT ON THE INTERNATIONAL CATALOGUE OF SCIENTIFIC LITERATURE

SIR: I have the honor to submit the following report on the operations of the United States Regional Bureau of the International Catalogue of Scientific Literature for the fiscal year ending June 30, 1931.

The routine work of the bureau, consisting mainly of compiling necessary records of current American scientific publications to be indexed for the catalogue when publication is resumed, has been continued.

In compliance with the resolution passed at the last international convention held in Brussels in July, 1922, this bureau has been kept in existence. This resolution, unanimously adopted, was "That the convention is of opinion that the international organization should be kept in being through mutual agreement to continue as far as possible the work of the regional bureaus until such time as it may be economically possible to resume publication." Complying with the intent of the resolution, this bureau has been continued, though with a force of only two employees, in order to keep the enterprise alive with the lowest possible expenditure of money. Each year part of the regular annual congressional appropriation has reverted to the Treasury; this year, out of the appropriation of $8,145, only $5,624 was spent, and thus $2,521 will revert.

This bureau is making every effort through the chairman of the executive committee, in whom authority to reorganize is vested, to influence the other bureaus to take the steps necessary to resume publication, but on account of depressed financial conditions still existing and the disorganized political situation in some countries no definite plan has yet been advanced. This is a situation to be deplored, for nothing has ever taken the place of the catalogue, and its need in the world of science becomes ever more obvious. Aside from the necessary cooperation by the regional bureaus in furnishing classified references for the Catalogue, a capital fund estimated at $75,000 is needed to refinance the central bureau, the editing and publishing center of the enterprise, and it seems probable that when a definite plan is presented some of the great endowed foundations interested in this and similar fields will provide this comparatively small sum.

Dr. Ernest Cushing Richardson, one of the great international authorities on bibliography, stated in a paper on the International Catalogue published in Science, June 20, 1930:

* * * The research endowments are bombarded with bibliographical projects of varying method and degrees of merit. They aid or support a good many projects. They are deeply concerned as trust organizations to put their money where it will do the most good. Other things being equal, they prefer to put it where one dollar will do the work of four. * * * It is here they can give the most bibliographical service with the least money. The proposition touches the libraries in a very similar way. If and when the matter is revived it will depend for financing, if not on the endowments, then on library subscriptions. If this machine is scrapped, when a new one is started either a $3,000,000 endowment must be had from promoters of research or a quadruple price charged to libraries.

Respectfully submitted.

LEONARD C. GUNNELL,
Assistant in Charge.

DR. CHARLES G. ABBOT,
Secretary, Smithsonian Institution.

APPENDIX 10

REPORT ON THE LIBRARY

SIR: I have the honor to submit the following report on the activities of the Smithsonian library for the fiscal year ended June 30, 1931:

THE LIBRARY

The library, or library system, of the Smithsonian Institution is made up of 46 separate libraries, each related in some special way to the work of the Institution and of the seven Government bureaus under its administrative charge. The chief of these is the Smithsonian deposit in the Library of Congress. The others are the library of the United States National Museum, the Smithsonian office library, the Langley aeronautical library, and the libraries of the Astrophysical Observatory, the Bureau of American Ethnology, the Division of Radiation and Organisms, the Freer Gallery of Art, the National Gallery of Art, and the National Zoological Park, together with the 36 sectional libraries in the National Museum. These collections, which number in all about 800,000 volumes, pamphlets, and charts, not to mention the thousands still uncatalogued, while they contain many publications on art, history, literature, philosophy, music, and education, pertain largely to science and technology. This important group of libraries has made available to Smithsonian employees and to American research workers in general, especially those connected with the various departments of the Government, most of the leading scientific publications of the world during one of its outstanding eras. Thus it has had a noteworthy part in carrying out since 1846—the year in which the Smithsonian began its activities—the will of James Smithson, the founder of the Institution.

CHANGES IN STAFF

During the last year there were several changes in the library staff. Miss Marian W. Seville was made head of the order department and promoted from the rank of library assistant to that of senior library assistant. Mrs. M. Landon Reed, who had served in the exchange department for some time on temporary appointment, was given a permanent position as clerk. Miss Margaret Moreland

was advanced from the grade of under library assistant to that of senior stenographer, to fill a new position established in the librarian's office at the beginning of the year. Miss Anna M. Link was promoted from the rank of minor library assistant to the place formerly occupied by Miss Moreland. Miss Virginia C. Whitney, a graduate in library science of George Washington University, was appointed minor library assistant to succeed Miss Link. The temporary employees were Mr. Alan Blanchard, Mrs. Daisy Cadle, Mrs. Lewis Deschler, Miss Katherine Everhart, Mrs. Grace A. Parler, Miss Jennette Seiler, Miss Eleanor Spielman, and Mr. Clyde Williams.

EXCHANGE OF PUBLICATIONS

The collections in the library system have been built up partly by the early provisions of the copyright law, partly by purchase and gift, but to a very large extent by exchange, for from the first the Institution and its branches have exchanged their publications for those of other learned institutions and societies and for scientific and technical journals and monographs. These have come to the Smithsonian library by mail or through the International Exchange Service, which is administered by the Institution.

In the course of the fiscal year just closed there came to the library by mail 24,594 packages and by the Exchange 1,688, each containing one or more publications. These were stamped, entered, and forwarded to the appropriate libraries of the system. Among the notable sendings, of which there were many, was one of 331 volumes and parts of Neerlandia from the Allgemeen Nederlandsch Verbond, at The Hague. This was assigned to the Smithsonian deposit.

The publications received included 4,565 dissertations from the universities of Basel, Berlin, Bern, Bonn, Breslau, Cornell, Erlangen, Gand, Giessen, Greifswald, Halle, Heidelberg, Helsingfors, Jena, Johns Hopkins, Kiel, Königsberg, Leiden, Leipzig, Lund, Marburg, Neuchâtel, Pennsylvania, Rostock, Strasbourg, Tübingen, Utrecht, Warsaw, and Zürich, the Academy of Freiberg, and technical schools at Aachen, Berlin, Braunschweig, Dresden, Karlsruhe, and Zürich.

Of the 1,808 letters written by the library staff during the year—an increase of 97 over 1930—nearly all had to do with the exchange of publications. At the close of the year this correspondence was up to date. The number of publications obtained in exchange in response to special requests from the various libraries of the Institution was much larger than usual, or 3,590. Exchange relations for several hundred new publications were entered into, particularly on behalf of the Smithsonian deposit, the Langley aeronautical library, and the libraries of the National Museum and Astrophysical Observatory.

GIFTS

During the year the library received many gifts. Chief among these was one of several thousand volumes and pamphlets, together with a collection of important letters and photographs, from the library of the late Dr. George P. Merrill, head curator of geology. These were presented by Mrs. Merrill and the other heirs of the estate and are to be kept in the office formerly occupied by Doctor Merrill, both as a permanent memorial to him and as an outstanding addition to the library in the division of geology. Other valuable collections received were as follows: 600 publications of a general scientific nature from Mrs. Dora W. Boettcher, given in memory of her husband, F. L. J. Boettcher, who was once connected with the Smithsonian Institution; 386 volumes and pamphlets from the heirs of the estate of the late Dr. O. P. Hay, of the Carnegie Institution, who for some years before his death used the library in the National Museum almost daily and gave it many valuable publications; 34 volumes, especially on atomic weights, together with a package of letters from the first four Secretaries of the Smithsonian, from the late Dr. Frank Wigglesworth Clarke; 30 publications by or about Prof. Henry Carvill Lewis, from his sister, Mrs. Edward S. Sayres; and 50 or more early numbers of periodicals on art, from Mrs. Marietta Comly. Among other gifts were 8 volumes on the history of Japan, from the Historiographical Institute, Tokyo; 4 volumes, namely, A Handbook of Mohammedan Decorative Arts, by M. S. Dimand, and Catalogue of European Daggers, Catalogue of European Court Swords and Hunting Swords, and Handbook of Arms and Armor, European and Oriental, by Bashford Dean, from the Metropolitan Museum of Art; and The Permian of Mongolia, by Amadeus W. Grabau, from the American Museum of Natural History. About 600 publications came from the American Association for the Advancement of Science, 267 from the International Catalogue of Scientific Literature, 255 from the Geophysical Laboratory, 55 from the American Association of Museums, and many from the Library of Congress.

Preeminent among the books presented to the library was a copy of Nippon, by Phillip Franz von Siebold, as reissued recently in five volumes by the Japaninstitut of Berlin. The narrative of the author's experiences in Japan during the years 1823 to 1830 is illustrated with pictures of the Japanese people and life during that period. This handsome and costly work, highly significant for its worth both as art and as history, was given to the Smithsonian by Mr. G. A. Pfeiffer, of New York, and was deposited in the library of the Freer Gallery of Art. Other unusual gifts included Machu Picchu, a Citadel of the Incas, by Senator Hiram Bingham, from

the National Geographic Society; Lo-Lang, a Report on the Excavation of Wang-Hsü's Tomb in the Lo-Lang Province, an Ancient Chinese Colony in Korea, by Yoshito Harada, with the Collaboration of Kingo Tazawa, from the Tokyo Imperial University; The Ellsworth Family, Volume II—Lincoln Elsworth, by Howard Eldred Kershner, from the National Americana Society; Impressions of Japanese Architecture, by Ralph Adams Cram, from the Japan Society of New York; Volumes IV and V of her well-known work, North American Wild Flowers, from Mrs. Charles D. Walcott; Volumes VII and VIII of the Smithsonian Scientific Series—Man from the Farthest Past, by Carl Whiting Bishop, and Cold-Blooded Vertebrates (Pt. I, Fishes; Pts. II and III, Amphibians and Reptiles), by Samuel F. Hildebrand, Dr. Charles W. Gilmore, and Doris M. Cochran—from the Smithsonian Institution; Clouds, by Alexander McAdie, from the Blue Hill Observatory; The Travels of Captain Robert Coverte, edited and presented by Boies Penrose; Wild Flowers of the Alleghanies, by Joseph E. Harned, from the author; William Henry Welch at Eighty, edited by Victor O. Freeburg, from the Milbank Memorial Fund; The Indians of Pecos Pueblo, by Earnest A. Hooton, from Phillips Academy; Handbook of Aeronautics, by the Royal Aeronautical Society of London, from the publishers, Gale & Polden (Ltd.); African Republic of Liberia and the Belgian Congo (Harvard African Expedition, 1926–27), in two volumes, edited by Richard P. Strong, from Harvey W. Firestone; Natural History of Birds, in two volumes, by George Edwards, from James Norris Woodward; and Tratado Elemental de Botánica, with typed index, by Carlos Cuervo Márgues, from W. A. Archer.

Gifts were also received from many members and associates of the Smithsonian staff, including Secretary Abbot, Assistant Secretary Wetmore, Dr. William H. Holmes, director of the National Gallery of Art, Dr. J. M. Aldrich, H. G. Barber, Dr. Marcus Benjamin, E. J. Brown, Dr. E. A. Chapin, Dr. A. H. Clark, Dr. Herbert Friedmann, Dr. O. P. Hay, Dr. Walter Hough, A. B. Howell, Dr. Aleš Hrdlička, Neil M. Judd, Dr. Remington Kellogg, Dr. W. R. Maxon, G. S. Miller, jr., A. J. Olmsted, J. C. Proctor, Miss Mary J. Rathbun, W. deC. Ravenel, Dr. C. W. Richmond, J. H. Riley, J. Townsend Russell, jr., Dr. Waldo Schmitt, Miss Marian Seville, and E. H. Walker.

SMITHSONIAN DEPOSIT

The Smithsonian deposit in the Library of Congress is, as has been said, the chief unit in the library system, numbering at present more than 500,000 volumes, pamphlets, and charts. It is peculiarly rich in scientific monographs, the reports, proceedings, and trans-

actions of learned institutions and societies, and scientific and technical journals. To the scholar, therefore, particularly in the fields of natural history, physical science, and technology, the deposit offers a wealth of material.

During the last fiscal year the Institution sent to the deposit 20,879 publications—an increase of 1,735 over the year before—or 2,626 volumes, 12,775 parts of volumes, 4,393 pamphlets, and 1,085 charts. Of these, 4,565 were dissertations. Of the charts, 883 were maps and atlases which the Smithsonian, in the course of the reorganization of its library system, had selected as worthy of preservation in its main library. Some of these were important manuscript maps; many of the others were also new to the division of maps in the Library of Congress.

The number of publications obtained by the Smithsonian library in exchange to meet special needs in the deposit was 2,364, or 159 more even than in 1930, when the records showed more than a two and a half fold increase over 1929 and almost a fivefold increase over 1928. This steady growth in the exchange service of the library on behalf of the deposit is worthy of note.

In addition to the publications sent to the deposit, several thousand documents of foreign governments, which were received by the Smithsonian library, were forwarded, without being stamped and entered, to the division of documents in the Library of Congress.

It might be added that toward the close of the year the Smithsonian library, with the aid of the National Museum, especially the section of photography, took steps, at the happy suggestion of the chief of the Smithsonian division in the Library of Congress, to have portraits made of the founder and five Secretaries of the Smithsonian Institution to be hung in that division with those of other prominent scientists already there. When they are finished, they will be presented for this purpose.

NATIONAL MUSEUM LIBRARY

In the library system of the Smithsonian Institution the library of the United States National Museum ranks next in size and influence to the Smithsonian deposit. Its 2 major and 36 minor collections are largely on natural history and technology. The catalogued items of the library total 79,407 volumes and 109,129 pamphlets. During the fiscal year 1931 the accessions to it were 2,528 volumes and 832 pamphlets, an increase of 375 over 1930. Many of these came by gift, more by purchase, but most by exchange.

The year was one of much progress, in which the staff went far toward making the library a more complete and available instrument

in the research work of the museum. This was the result partly of the appointment to the Museum and other permanent library rolls of the Smithsonian of several new trained assistants and partly of the increase in funds for the acquisition of material needed by the scientists which could not be obtained by exchange. The staff entered 8,799 periodicals, substituting for the old system of entry a new system that is being employed extensively by libraries using Library of Congress cards. They catalogued 1,639 volumes, 785 pamphlets, and 17 charts, or 427 more than the previous year. They also, as in former years, did the cataloguing and entering for the library of the National Gallery of Art, the total number of publications thus treated being 311 and 533 respectively—twice the number of 1930. They contributed 11,193 cards to the Museum catalogue and revised 672 catalogue headings. They also added 8,036 cards to the shelf lists, and prepared almost as many duplicate cards for the union shelf list in the Smithsonian Building. They sent to the sectional libraries 6,522 volumes and parts and to the members of the scientific staff for their personal use 1,419 reprints, many of which had come to light in the process of sorting the few remaining collections of miscellaneous material in the library. They filed the Wistar Institute cards as they came in, and brought up to date the filing of the large accumulation of Concilium Bibliographicum cards of the author set, 17,000 cards being added to this file. The current cards of the systematic set were forwarded to the sections that have files on their special subjects. The number of volumes bound was 1,402, or 131 more than in 1930. In this connection it may be added that more volumes than usual were completed by special exchange letters, the number of publications received in response to them being 1,090, an increase of 402 over the year before.

The number of publications loaned to the staff of the Smithsonian and its branches totaled 7,221, more than one-third of which were charged in the reading room of the Arts and Industries Building. Of these the library borrowed 2,049 from the Library of Congress and 271 elsewhere. Loans of 142 publications were made to libraries not in the Smithsonian system. The number of volumes returned to the Library of Congress was 2,519 and to other libraries 407—in each instance many more than usual.

The main shelf list—that of the collection in the Natural History Building—was completed early in the year, and the work of taking an inventory was begun. This had to be discontinued, however, in the fall, owing to lack of help.

Finally, attention should be called to the fact that even with the 400 feet of new shelving that the Museum installed for the collection in 1930 the natural history library is still in a very crowded condi-

tion. Sufficient space and equipment both to relieve its present congestion and to permit of growth for a period of years should be provided as soon as possible.

During the year the Museum library staff was able to assist only a few of the sectional libraries with their special problems, including those in the divisions of plants, mammals, and geology.

These libraries number 36, and are as follows:

Administration.
Administrative assistant's office.
American archeology.
Anthropology.
Biology.
Birds.
Botany.
Echinoderms.
Editor's office.
Ethnology.
Fishes.
Foods.
Geology.
Graphic arts.
History.
Insects.
Invertebrate paleontology.
Mammals.
Marine invertebrates.
Mechanical technology.
Medicine.
Minerals.
Mineral technology.
Mollusks.
Old World archeology.
Organic chemistry.
Paleobotany.
Photography.
Physical anthropology.
Property clerk's office.
Reptiles and batrachians.
Superintendent's office.
Taxidermy.
Textiles.
Vertebrate paleontology.
Wood technology.

OFFICE LIBRARY

The office library consists of works of general reference, sets of the publications of the Smithsonian and its branches, and of various foreign societies and institutions, as well as numerous publications of a less learned and more cultural and even recreational character for use during the leisure hours of the Smithsonian employees. The additions to the library in the course of the last 12 months were 686 volumes and 32 pamphlets. The number of periodicals entered was 229.

BUREAU OF AMERICAN ETHNOLOGY LIBRARY

The library of the Bureau of American Ethnology contains 26,671 volumes and 16,717 pamphlets, chiefly on the archeology, history, myths, religion, arts, sociology, language, and general culture of the early peoples of the Western Hemisphere, especially of the North American Indian. The collection was increased during the past year by 600 volumes and 190 pamphlets. The number of periodicals entered was 3,500, and of cards added to the catalogue 3,500. The number of volumes bound was 473. The loans were 875.

ASTROPHYSICAL OBSERVATORY LIBRARY

The library of the Astrophysical Observatory is closely related in content to the researches in astrophysics and meteorology that are being conducted by the Institution. It has 4,188 volumes and 3,192 pamphlets. The additions during the year were 180 volumes and 92 pamphlets. The number of volumes bound was 127.

RADIATION AND ORGANISMS LIBRARY

The library of radiation and organisms is a small, highly specialized collection pertaining to one of the newer interests of the Institution, for the furthering of which it recently organized a division. During 1930 publications bearing mainly on this interest to the number of 20 volumes, 1 pamphlet, and several periodicals were added, bringing the collection to 94 volumes, 9 pamphlets, and 6 charts. Space and equipment, adequate for some years to come, were provided for the library in the north tower of the Smithsonian Building.

LANGLEY AERONAUTICAL LIBRARY

The Smithsonian's well-known collection of aeronautical publications is now deposited in the Library of Congress, where, under its own stamp and bookplate, it occupies a unique place in the division of aeronautics and is even more available as an aid in research than it was before 1930, when it was transferred from the Institution. It will continue to bear the name of the Langley aeronautical library, in memory of Samuel Pierpont Langley, who while Secretary of the Smithsonian made a notable contribution to the science of aeronautics. Most of the collection once belonged to Doctor Langley, and to other experimenters associated with him, including Alexander Graham Bell, Octave Chanute, and James Means. The rest of it has been received from time to time by the Institution chiefly in exchange for its publications. The library contains 1,856 volumes and 1,056 pamphlets. Among its items are sets, including most of the early numbers, of the aeronautical magazines, both American and foreign, and many other important publications, some of which are very rare, together with files of photographs, letters, and newspaper clippings.

During the fiscal year just closed the Smithsonian library was instrumental in increasing the Langley collection by 45 per cent more than in 1930, or by 122 volumes, 445 parts of volumes, and 133 pamphlets. Most of these were obtained by exchange. In this connection it may be added that the library, cooperating with the division of aeronautics in the Library of Congress, entered into exchange

relations, on behalf of the Langley collection, with 50 or more new aeronautical societies and institutions, and received in response to its special requests many publications. It is hoped that this service on the part of the Smithsonian library can be considerably enlarged in the near future.

NATIONAL GALLERY OF ART LIBRARY

The library of the National Gallery of Art contains many valuable works on art, both American and foreign, including sets of the leading magazines. The collection numbers 1,243 volumes and 1,332 pamphlets. During the last year its accessions were 145 volumes, 166 pamphlets, and 533 periodicals. Most of these came by purchase and exchange. Numerous gifts were received, however, especially from Dr. William H. Holmes, director of the gallery, and Mr. James Townsend Russell, jr., honorary collaborator in Old World archeology in the National Museum. The number of volumes bound was 51.

FREER GALLERY OF ART LIBRARY

The library of the Freer Gallery of Art is a prominent member of the Smithsonian library system. As the collection has to do largely with the arts and cultures of the Far East, India, Persia, and the nearer east, it is not only a unique and valuable aid to those immediately connected with the gallery, as well as to visitors who come there for research, but in many of its items—notably those in Chinese and Japanese, not a few of which are extremely rare—it supplements to an unusual degree the collection in the oriental division of the Library of Congress. In the library, too, are works on the lives and art of various American painters, especially James McNeill Whistler, a large number of whose pictures are owned by the gallery. It also has numerous publications on the Washington manuscripts, the well-known fourth and fifth century manuscripts of the Bible, which are among the treasures of the gallery.

The main library, which is kept permanently in the gallery, consists of 4,423 volumes and 3,148 pamphlets. Its accessions during the year just closed were 61 volumes and 150 pamphlets. The number of volumes bound was 20. In addition to its main library, the gallery has a special collection, numbering 814 volumes and 500 pamphlets, chiefly of archeological interest, which is for the use of its staff in the field. Among the significant publications deposited in the library during the year by the Smithsonian Institution were a copy of Nippon, by Phillip Franz von Siebold, and of Lo-Lang, by Yoshito Harada and Kingo Tazawa—two of the gifts described in more detail earlier in this report. The work of reclassifying and recataloguing the collections, which was begun the year before, was carried

almost to completion, 6,083 cards being added to the dictionary catalogue of the library and a like number being prepared for filing in the union catalogue in the Smithsonian Building. This notable progress was made possible by the further generous cooperation of the gallery with the Smithsonian library. Of the 435 visitors, 216 came to study, 16 to make sketches from plates, and 203 to see the reproductions of the Washington manuscripts.

NATIONAL ZOOLOGICAL PARK LIBRARY

Among the 1,217 volumes and 407 pamphlets in the library of the National Zoological Park are many of great value to those interested in the care and habits of animals. Its additions for the year were four volumes and four pamphlets.

SUMMARY OF ACCESSIONS

The accessions for the year may be summarized as follows:

Library	Volumes	Pamphlets and charts	Total
Astrophysical Observatory	180	92	272
Bureau of American Ethnology	600	190	790
Freer Gallery of Art	61	150	211
Langley Aeronautical	122	133	255
National Gallery of Art	145	166	311
National Zoological Park	4	4	8
Radiation and Organisms	20	1	21
Smithsonian deposit, Library of Congress	2,626	5,478	8,104
Smithsonian office	686	32	718
United States National Museum	2,528	832	3,360
Total	6,972	7,078	14,050

It is estimated that on June 30, 1931, the number of volumes, pamphlets, and charts in the Smithsonian library system was as follows:

Volumes	578,057
Pamphlets	192,477
Charts	26,346
Total	796,880

In addition to this total, there were, of course, many thousands of volumes still uncatalogued or awaiting completion.

UNION CATALOGUE

Besides keeping up the current cataloguing work, the staff completed the shelf list of the National Museum library and prepared a copy of part of it for filing with the union shelf list in the Smithsonian Building; catalogued and arranged the publications of

the Carnegie Institution of Washington; finished cataloguing the John Donnell Smith collection, including a large set of miscellaneous publications, for which they prepared about 1,100 analytical and subject entries; began the recataloguing of the general botanical collection in the National Museum; and, finally, made notable progress in the work, begun the year before, of reclassifying and recataloguing the library of the Freer Gallery of Art.

The work on the union catalogue and shelf list may be summed up by the following statistics:

Volumes catalogued	5,127
Volumes recatalogued	37
Pamphlets catalogued	2,754
Pamphlets recatalogued	3
Charts catalogued	219
Typed cards added to catalogue	7,896
Library of Congress cards added to catalogue	14,949
Museum cards copied for union shelf list	13,219
Freer cards prepared for union catalogue and shelf list, to be added later	7,551

SPECIAL ACTIVITIES

A number of special tasks were undertaken by the staff during the year. These were chiefly connected with the reorganization of the library system that has been going on for some time.

Further progress was made in sorting the miscellaneous material in the west stacks of the Smithsonian Building, and hundreds of publications were found that were lacking in the libraries of the Institution. The art-room collection was checked and a list prepared for the National Gallery of Art. The regents' and archives' sets of Smithsonian publications were also checked and, so far as possible, the missing numbers supplied. The natural history collection in the National Museum was shifted and rearranged, to make it less crowded and more accessible, and a similar treatment of the technology collection was begun.

Many publications—in some cases, whole files—not needed by the Institution or its branches, were transferred to other Government libraries. These included 1,935 publications of the United States Geological Survey, 904 of the Canadian Geological Survey, and 100 of a miscellaneous character. They likewise included the rolls of 883 maps and atlases that had been stored for many years in the old Museum.

Four hundred and fifty of the duplicates among the publications of the Carnegie Institution of Washington were sent back to that institution. In return the Carnegie give the Smithsonian many of the volumes that were lacking in its sets. The duplicate publica-

tions of the University of California received similar treatment, 476 items being returned to the university and a large number sent to the Institution toward completing its files.

The librarian gave several lectures, on Shakespeare, Virgil, the Nature of Poetry, and the Smithsonian Institution, before various groups in Washington, including the Cosmos Club, the Shakespeare Society, the Classical Club, and American University.

CONCLUSION

Despite the fact that the year was one of the most successful since the beginning of the reorganization of the library system in 1924, much more could have been accomplished both for the libraries in the system and for the scientists and other employees of the Smithsonian if sufficient funds had been at hand for the purchase of all the books and periodicals not obtainable by exchange that were needed in the current work of the Institution; if the binding allotment had been large enough to permit the binding of all the volumes prepared during the year—as it was, 600 had to be held for months as they could not be sent to the bindery until after June 30; and, most of all, if it had been possible to employ more permanent trained assistants. Among the additional personnel needed on the library staff are several cataloguers and general library assistants, a typist, and a messenger.

Respectfully submitted.

WILLIAM L. CORBIN, *Librarian.*

Dr. CHARLES G. ABBOT,
Secretary, Smithsonian Institution.

APPENDIX 11

REPORT ON PUBLICATIONS

SIR: I have the honor to submit the following report on the publications of the Smithsonian Institution and the Government bureaus under its administrative charge during the year ending June 30, 1931:

A consolidation of all the editorial work of the Institution and its branches, put in effect by the secretary on March 1, 1931, brought all of the 13 series of publications issued by the Smithsonian under the general direction of the editor. This step was taken in the interests of greater unity of editorial policy, more efficiency, and less duplication in the keeping of the many records, financial and otherwise, necessary in an editorial office, and, most important of all, greater accuracy and more prompt appearance of Smithsonian publications.

On January 31, 1931, Dr. Marcus Benjamin, editor of the National Museum, retired after a service of 35 years. He was succeeded by Paul H. Oehser, formerly on the editorial staff of the Bureau of Biological Survey. Mr. Oehser and Mr. Stanley Searles, editor of the Bureau of American Ethnology, will continue in charge of the editorial work of their respective bureaus, but by centralizing the general direction of the work in the office of the editor of the Smithsonian Institution, the advantage is gained of establishing a definite point of contact between heads of bureaus, authors, and the Government Printing Office. Furthermore, the same general style can now be adopted for all the series published under the Institution, so that authors, many of whom publish in several of the series, will know beforehand what style is expected. To aid toward this end, it is proposed to issue a condensed style sheet based on the Style Manual of the Government Printing Office, covering those matters that occur constantly in every manuscript and concerning which authors and typists are often in doubt.

PUBLICATIONS ISSUED DURING THE YEAR

The Institution proper published during the year 16 papers in the series of Smithsonian Miscellaneous Collections, 1 annual report and pamphlet copies of the 24 articles contained in the report appendix, and 3 special publications. The United States National Museum

issued 1 annual report, 1 volume of proceedings, 3 complete bulletins, 1 part of a bulletin, 1 complete volume, 1 part and 1 index in the series Contributions from the National Herbarium, and 40 separates from the proceedings. The Bureau of American Ethnology published two annual reports and three bulletins.

Of these publications there were distributed 205,711 copies, which included 29 volumes and separates of the Smithsonian Contributions to Knowledge, 27,425 volumes and separates of the Smithsonian Miscellaneous Collections, 25,984 volumes and separates of the Smithsonian annual reports, 4,627 Smithsonian special publications, 37,967 copies of the Brief Guide to the Smithsonian Institution, 86,680 volumes and separates of the various series of the National Museum publications, 29,475 publications of the Bureau of American Ethnology, 118 publications of the National Gallery of Art, 1,355 publications of the Freer Gallery of Art, 10 volumes of the Annals of the Astrophysical Observatory, 65 reports of the Harriman Alaska Expedition, and 1,036 reports of the American Historical Association.

SMITHSONIAN MISCELLANEOUS COLLECTIONS

Of the Smithsonian Miscellaneous Collections, volume 73, 1 paper was issued; volume 82, 10 papers; volume 83, 1 paper and index and table of contents, comprising the whole volume; volume 84, 1 paper and index and table of contents, comprising the whole volume; and volume 85, 3 papers; making 16 papers in all, as follows:

VOLUME 73

No. 7. Opinions Rendered by the International Commission on Zoological Nomenclature: Opinions 115 to 123. 36 pp. (Publ. 3072.)

VOLUME 82

No. 8. Four New Raccoons from the Keys of Southern Florida. By E. W. Nelson. July 10, 1930. 12 pp., 5 pls. (Publ. 3066.)

No. 9. The Further and Final Researches of Joseph Jackson Lister upon the Reproductive Processes of Polystomella Crispa (Linné). By Edward Heron-Allen, F. R. S. November 26, 1930. 11 pp., 7 pls. (Publ. 3067.)

No. 10. Morphology of the Bark Beetles of the Genus Gnathotrichus Eichh. By Karl E. Schedl. January 24, 1931. 88 pp., 40 text figs. (Publ. 3068.)

No. 12. The Five Monacan Towns in Virginia, 1607. By David I. Bushnell, jr. November 18, 1930. 38 pp., 14 pls. (Publ. 3070.)

No. 13. A Note on the Skeletons of Two Alaskan Porpoises. By Gerrit S. Miller, jr. December 23, 1930. 2 pp., 1 pl. (Publ. 3107.)

No. 14. The Supposed Occurrence of an Asiatic Goat-Antelope in the Pleistocene of Colorado. By Gerrit S. Miller, jr. December 22, 1930. 2 pp., 2 pls. (Publ. 3108.)

No. 15. Three Small Collections of Mammals from Hispaniola. By Gerrit S. Miller, jr. December 24, 1930. 10 pp., 2 pls. (Publ. 3109.)

No. 16. The Ductless Glands of Alligator mississippiensis. By A. M. Reese. March 9, 1931. 14 pp., 3 pls. (Publ. 3110.)

No. 17. The Types of Lamarck's Genera of Shells as Selected by J. G. Children in 1823. By A. S. Kennard, A. L. S., A. E. Salisbury, and B. B. Woodward, F. L. S. July 11, 1931. 40 pp. (Publ. 3112.)

No. 18. Tropisms and Sense Organs of Coleoptera. By N. E. McIndoo. April 18, 1931. 70 pp., 2 pls., 19 text figs. (Publ. 3113.)

VOLUME 83

(Whole volume.) The Skeletal Remains of Early Man. By Aleš Hrdlička. July 24, 1930. 379 pp., 93 pls., 39 text figs. (Publ. 3033.)

Title-page and table of contents. 8 pp. (Publ. 3075.)

VOLUME 84

(Whole volume.) A History of Applied Entomology (Somewhat Anecdotal). By L. O. Howard. November 29, 1930. 564 pp., 51 pls. (Publ. 3065.)

Title-page and table of contents. 8 pp. (Publ. 3118.)

VOLUME 85

No. 1. Weather Dominated by Solar Changes. By C. G. Abbot. February 5, 1931. 18 pp., 4 text figs. (Publ. 3114.)

No. 2. The Avifauna of the Pleistocene in Florida. By Alexander Wetmore. April 13, 1931. 41 pp., 16 figs., 6 pls. (Publ. 3115.)

No. 3. Addenda to Descriptions of Burgess Shale Fossils. By Charles D. Walcott. 46 pp., 23 pls., 11 text figs. (Publ. 3117.)

SMITHSONIAN ANNUAL REPORTS

Report for 1929.—The complete volume of the Annual Report of the Board of Regents for 1929 was received from the Public Printer in November, 1930.

Annual Report of the Board of Regents of the Smithsonian Institution showing the operations, expenditures, and condition of the Institution for the year ending June 30, 1929. xiii+622 pp., 91 pls., 56 text figs. (Publ. 3034.)

The appendix contained the following papers:

The Physics of the Universe, by Sir James Jeans.
Counting the Stars and Some Conclusions, by Frederick H. Seares.
The Lingering Dryad, by Paul R. Heyl.
What is Light? by Arthur H. Compton.
Artificial Cold, by Gordon B. Wilkes.
Photosynthesis, by E. C. C. Baly.
Newly Discovered Chemical Elements, by N. M. Bligh.
Synthetic Perfumes, by H. Stanley Redgrove.
X-Raying the Earth, by Reginald A. Daly.
Extinction and Extermination, by I. P. Tolmachoff.
The Gulf Stream and its Problems, by H. A. Marmer.
The Mystery of Life, by F. G. Donnan.
The Transition from Live to Dead; the Nature of Filtrable Viruses, by A. E. Boycott.

Heritable Variations, their Production by X rays, and their Relation to Evolution, by H. J. Muller.

Social Parasitism in Birds, by Herbert Friedmann.

How Insects Fly, by R. E. Snodgrass.

Climate and Migrations, by J. C. Curry.

Ur of the Chaldees: More Royal Tombs, by C. Leonard Woolley.

The Population of Ancient America, by H. J. Spinden.

The Aborigines of the Ancient Island of Hispaniola, by Herbert W. Krieger.

The Beginning of the Mechanical Transport Age in America, by Carl W. Mitman.

The Servant in the House; a Brief History of the Sewing Machine, by Frederick L. Lewton.

Thomas Chrowder Chamberlin (1843–1928), by Bailey Willis.

Hideyo Noguchi, by Simon Flexner.

Report for 1930.—The report of the executive committee and proceedings of the Board of Regents of the Institution and the report of the secretary, both forming parts of the annual report of the Board of Regents to Congress, were issued in December, 1930.

Report of the executive committee and proceedings of the Board of Regents of the Smithsonian Institution for the year ending June 30, 1930. 14 pp. (Publ. 3074.)

Report of the Secretary of the Smithsonian Institution for the year ending June 30, 1930. 140 pp., 5 text figs. (Publ. 3073.)

The general appendix to this report, which was in press at the close of the year, contains the following papers:

Beyond the Red in the Spectrum, by H. D. Babcock.

Growth in our Knowledge of the Sun, by Charles E. St. John.

The Modern Sun Cult, by J. W. Sturmer.

The Moon and Radioactivity, by V. S. Forbes.

Modern Concepts in Physics and their Relation to Chemistry, by Irving Langmuir.

Waves and Corpuscles in Modern Physics, by Louis de Broglie.

New Researches on the Effect of Light Waves on the Growth of Plants, by F. S. Brackett and Earl S. Johnston.

The Autogiro: Its Characteristics and Accomplishments, by Harold F. Pitcairn.

Ten Years' Gliding and Soaring in Germany, by Prof. Dr. Walter Georgii.

The First Rains and their Geological Significance, by Asaar Hadding.

Weather and Glaciation, by Chester A. Reeds.

Wild Life Protection: An Urgent Problem, by Ernest P. Walker.

The Nesting Habits of Wagler's Oropendola on Barro Colorado Island, by Frank M. Chapman.

The Rise of Applied Entomology in the United States, by L. O. Howard.

Man and Insects, by L. O. Howard.

The Use of Fish Poisons in South America, by Ellsworth P. Killip and Albert C. Smith.

A Rare Parasitic Food Plant of the Southwest, by Frank A. Thackery and M. French Gilman.

The Mechanism of Organic Evolution, by Charles B. Davenport.

Extra Chromosomes, a Source of Variations in the Jimson Weed, by Albert F. Blakeslee.

The Age of the Human Race in the Light of Geology, by Stephen Richarz.

Elements of the Culture of the Circumpolar Zone, by W. G. Bogoras.

The Tell en-Nasbeh Excavations of 1929—a preliminary report, by William Frederic Badé.

Recent Progress in the Field of Old World Prehistory, by George Grant MacCurdy.

Ancient Seating Furniture in the Collections of the United States National Museum, by Walter Hough.

Aspects of Aboriginal Decorative Art in America Based on Specimens in the United States National Museum, by Herbert W. Krieger.

The Acclimatization of the White Race in the Tropics, by Robert de C. Ward.

The Eighth Wonder: The Holland Vehicular Tunnel, by Carl C. Gray and H. F. Hagen.

George Perkins Merrill, by Charles Schubert.

Jesse Walter Fewkes, by John R. Swanton and F. H. H. Roberts, jr.

FREER GALLERY OF ART PUBLICATIONS

Yaksas, Part II. By Ananda K. Coomaraswamy. May 19, 1931. 84 pp., 50 pls. (Publ. 3059.)

SPECIAL PUBLICATIONS

Explorations and Field Work of the Smithsonian Institution in 1930. March 25, 1931. 224 pp., 198 figs. (Publ. 3111.)

Classified List of Smithsonian Publications Available for Distribution, May 22, 1931. Compiled by Helen Munroe. May 22, 1931. 30 pp. (Publ. 3119.)

Brief Guide to the Smithsonian Institution. January 15, 1931. 79 pp.

PUBLICATIONS OF THE UNITED STATES NATIONAL MUSEUM

Through the retirement of Dr. Marcus Benjamin on January 31, 1931, the editorial work of the National Museum devolved upon W. P. True until Paul H. Oehser was appointed on April 15, 1931, to fill the vacancy. During the year ending June 30, 1931, the Museum published 1 annual report, 1 volume of proceedings, 3 complete bulletins, 1 part of a bulletin, 1 complete volume, 1 part and 1 index in the series Contributions from the United States National Herbarium, and 40 separates from the proceedings.

The issues of the bulletin were as follows:

Bulletin 82. A Monograph of the Existing Crinoids. Volume 1—The Comatulids. Part 3. Superfamily Comasterida. By Austin Hobart Clark.

Bulletin 100. Contributions to the Biology of the Philippine Archipelago and Adjacent Regions.

Volume 11. The Fishes of the Families Pseudochromidae, Lobotidae, Pempheridae, Priacanthidae, Lutjanidae, Pomadasyidae, and Teraponidae, Collected by the United States Bureau of Fisheries Steamer *Albatross*, Chiefly in Philippine Seas and Adjacent Waters. By Henry W. Fowler.

Bulletin 154. A Study of the Teiid Lizards of the Genus Cnemidophorus, with Special Reference to Their Phylogenetic Relationships. By Charles E. Burt.

Bulletin 155. The Birds of Haiti and the Dominican Republic. By Alexander Wetmore and Bradshaw H. Swales.

The issues of the contributions from the United States National Herbarium were as follows:

Volume 24. Title Page, Preface, Contents, List of Illustrations, and Index to Volume 24, Contributions from the United States National Herbarium.
Volume 24. Plant Studies—Chiefly Tropical American.
Volume 26, part 6. Asiatic Pteridophyta collected by Joseph F. Rock 1920–1924. By Carl Christensen.

Of the separates from the proceedings, 11 were from volume 77, 23 from volume 78, and 6 from volume 79.

PUBLICATIONS OF THE BUREAU OF AMERICAN ETHNOLOGY

The editorial work of the bureau has continued under the direction of the editor, Stanley Searles. During the year two annual reports and three bulletins were issued, as follows:

Forty-fifth Annual Report. Accompanying papers: The Salishan Tribes of the Western Plateaus (Teit, edited by Boas); Tattooing and Face and Body Painting of the Thompson Indians, British Columbia (Teit, edited by Boas); The Ethnobotany of the Thompson Indians of British Columbia (Steedman); The Osage Tribe; Rite of the Wa-xo-be (LaFlesche). vii+857 pp., 29 pls., 47 figs.
Forty-sixth Annual Report. Accompanying papers: Anthropological Survey in Alaska (Hřdlička); Report to the Honorable Isaac S. Stevens, Governor of Washington Territory, on the Indian Tribes of the Upper Missouri (Denig, edited by Hewitt), vii+654 pp., 80 pls., 35 figs.
Bulletin 96. Early Pueblo Ruins in the Piedra District, Southwestern Colorado (Roberts). ix+190 pp., 55 pls., 40 figs.
Bulletin 97. The Kamia of Imperial Valley (Gifford). vii+94 pp., 2 pls., 4 figs.
Bulletin 100. The Ruins at Kiatuthlanna, Eastern Arizona (Roberts). viii+195 pp., 47 pls., 31 figs.

Publications in press at the close of the fiscal year were as follows:

Forty-seventh Annual Report. The Acoma Indians (White); Isleta, New Mexico (Parsons); Introduction to Zuñi Ceremonialism, and Zuñi Origin Myths (Bunzel); Zuñi Ritual Poetry (Bunzel); Zuñi Katcinas (Bunzel).
Bulletin 94. Tobacco Among the Karuk Indians of California (Harrington).
Bulletin 98. Tales of the Cochiti Indians (Benedict).
Bulletin 99. Cherokee Sacred Formulas and Medicinal Prescriptions (Mooney and Olbrechts).
Bulletin 101. Indian Blankets of the North Pacific Coast (Kissell).
Bulletin 102. Menominee Music (Densmore).
Bulletin 103. Source Material for the Social and Ceremonial Life of the Choctaw Indians (Swanton).
Bulletin 104. A Survey of the Ruins in the Region of Flagstaff, Arizona (Colton).
Bulletin 105. Notes on the Wapanowiweni (Michelson).

REPORT OF THE AMERICAN HISTORICAL ASSOCIATION

The annual reports of the American Historical Association are transmitted by the association to the Secretary of the Smithsonian Institution and are communicated by him to Congress, as provided by the act of incorporation of the association.

The annual reports for 1927 and 1928 (1 volume), and for 1929, were issued during the year, and also the supplemental volume to the report for 1927. The annual report for 1930, Volume III, and the supplemental volume to the report for 1928, were in press at the close of the year.

REPORT OF THE NATIONAL SOCIETY, DAUGHTERS OF THE AMERICAN REVOLUTION

The manuscript of the Thirty-third Annual Report of the National Society, Daughters of the American Revolution, was transmitted to Congress, in accordance with the law, November 12, 1930.

ALLOTMENTS FOR PRINTING

The congressional allotments for the printing of the Smithsonian report to Congress and the various publications of the Government bureaus under the administration of the Institution were virtually used up at the close of the year. The appropriation for the coming year ending June 30, 1932, totals $104,000, allotted as follows:

Annual report to the Congress of the Board of Regents of the Smithsonian Institution	$12,000
National Museum	50,000
Bureau of American Ethnology	28,300
National Gallery of Art	500
International Exchanges	300
International Catalogue of Scientific Literature	100
National Zoological Park	300
Astrophysical Observatory	500
Annual report of the American Historical Association	12,000

SMITHSONIAN ADVISORY COMMITTEE ON PRINTING AND PUBLICATION

The editor continued to serve as secretary to the Smithsonian advisory committee on printing and publication until March 1, 1931, when the committee was dissolved by the reorganization of the editorial department of the Institution mentioned earlier in this report. Four meetings were held and 88 manuscripts were acted upon. The membership at the last meeting was as follows: Dr. Leonhard Stejneger, head curator of biology, National Museum, chairman; Dr. William M. Mann, director, National Zoological Park; Mr. M. W.

Stirling, chief, Bureau of American Ethnology; Dr. R. S. Bassler, head curator of geology, National Museum; W. P. True, editor of the Institution, secretary; and Stanley Searles, editor of the Bureau of American Ethnology.

Since the editorial reorganization, manuscripts come directly to the editor of the Smithsonian Institution with the recommendation of the head of the publishing bureau, who has taken expert advice as to their merit and suitability for printing.

W. P. TRUE, *Editor.*

Dr. CHARLES G. ABBOT,
Secretary, Smithsonian Institution.

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